# Coal Age

SEPTEMBER, 1957

A McGRAW-HILL PUBLICATION—PRICE SI

# **Faster Stripping**

Saxton Coal boosts efficiency with a faster dragline and a compact cleaning plant . . . p 74

# Barge Loading

New conveyors raise capacity of Armco Steel Corp.'s barge loading plant to 900 tph . . . . p 90



Designing A Haulage System . . . p 84



# Mechanization returns greater dividends with Edison R-4 Cap Lamps on the job

Edison R-4 Electric Cap Lamps can help modern mining machines realize their *full* potential.

Reason why? Because more and better light is always on the job with the brilliant, unfailing beam of the Edison R-4. This dependable source of illumination permits the miner to perform his duties with utmost efficiency and safety. You don't have long to wait for results with the Edison R-4, either. They register quickly in terms of accident prevention and increased tonnage per man-shift.

Let us demonstrate the advantages of this *quality* cap lamp in your underground operation. Write or call us soon for more detailed information.



## MINE SAFETY APPLIANCES COMPANY

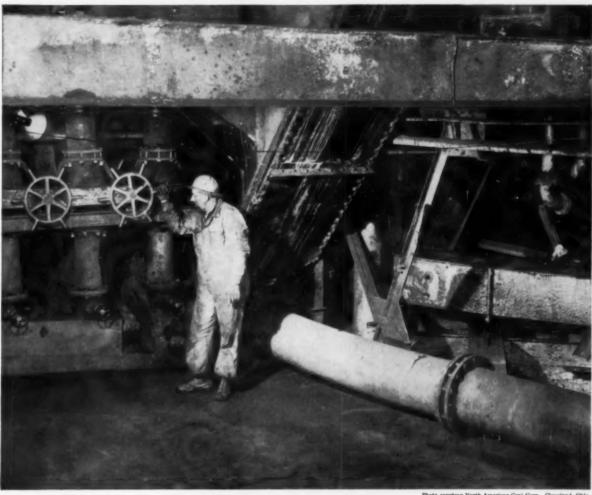
201 North Braddock Avenue, Pittsburgh 8, Pa.

At Your Service: 76 Branch Offices in the United States

#### MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED

Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S.
Representatives in Principal Cities in Mexico, Central and South America
Cable Address: "MINSAF" Pittsburgh

# **B.F.Goodrich report:**



# Hose swallows needle-sharp slivers of coal

# B. F. Goodrich improvements in rubber brought extra savings

Problem: At this mine, coal is put through a huge washing machine that shakes rock and sand out of the coal, much like a home washer shakes dirt out of clothes.

The water-8000 gallons of it a minute-used to be circulated in and out of the coal washer by steel pipes. But the water is loaded with tiny particles of coal—hard and sharp, like needles—that wore holes right through the steel. Welders worked every weekend, patching holes. The pipe was being replaced every year.

What was done: When a B.F. Goodrich

distributor heard about the trouble, he suggested a rubber hose developed by B.F. Goodrich for handling rough materials. It is made with a special lining of the toughest wear-resisting rubber known. This rubber is so tough that, on many jobs, it outlasts the hardest steel 10 to 1.

Savings: The B.F. Goodrich rubber hose was tried. You see one big length of it at right in the picture. It has been on the job over 4 years now, and is still in excellent condition. No holes, no repairs, no problems of any kind.

Where to buy: Your B.F. Goodrich

distributor has exact specifications for the B.F. Goodrich hose described here. And, as a factory-trained specialist in rubber products, he can answer your questions about all the rubber products B.F. Goodrich makes for industry. B.F. Goodrich Industrial Products Co., Dept. M-173, Akron 18, Obio.







# for QUALITY LUBRICANTS

for the Coal Mining Industry, the name to remember is...



Hulburt



#### choose Hulburt

no other lubricant available to the coal mining industry can compare in performance with Hulburt AP Grease and No. 11 Lubricants.

#### choose Hulburt

only Hulburt AP Grease, the famous "strawberry grease", can claim no melting point, complete resistance to water, and many extra hours of heavy duty lube protection.

#### choose Hulburt

Hydraulic systems and gear cases gain added life and operate smoother when serviced with Hulburt No. 11 Lubricants The reason highest film strength, plus positive oxidation, rust and anti-foam protection.

# HULBURT Oil & Grease Company

Philadelphia 34, Pa.

Specialists in Quality Lubricants for the Coal Mining Industry



Before you buy any screen centrifuge to dewater your fine coal...

Ask yourself these 2 questions...

- 1. How often will I have to change screens?
- 2. How much power will it take per ton of dried coal?

The Bird-Humboldt Oscillating Screen Centrifuge keeps going without a screen change or any other maintenance for four to six months. Screen replacement cost is under a half cent per ton.

The Bird-Humboldt takes only 0.2 KWH per ton of delivered coal.

What's more the Bird-Humboldt gets the coal dry (5% or less surface moisture on ¼ x 28 mesh) — recovers 98 to 99% of the solids — virtually eliminates degradation — delivers 60 to 80 tons of coal per hour.

On this basis can you afford to buy, or even to continue to operate, any other screen machine?



May we mail you the Bird-Humboldt Bulletin telling the complete story?



BIRD-HUMBOLDT Screen Centrifugal Dryer

BIRD MACHINE COMPANY . SOUTH WALPOLE . MASSACHUSETT

# This Month in

SEPTEMBER 1957

# Coal Age

Editorials	p	69
Testing to Select Better Mining Personnel	p	70
Simpler Supply Receiving	p	73
Faster Stripping, Simpler Cleaning	p	74
Commercial Gas From Brown Coal	p	81
Designing a Deep-Mine Haulage System	p	84
Machine Tamping of Blastholes	p	88
Rebuilding Barge Plant for Higher Capacity	p	90
Foremen's Forum . p 94 Operating Ideas	p	98
Equipment News . p 102 News Roundup	p	126
C-1 C		

# **▶** Personnel Management

Testing to Select Better Personnel for
Coal Mining Today ...... p 70

Harold L. Durrett, Personnel Manager, Ireland Mine, Hanna Coal Co., and

Dr. Quin F. Curtis, Head, Philosophy and Psychology Dept., West Virginia University

Continuing expansion of the industry has sharpened the need for more accurate selection and placement of personnel. To meet this need, Hanna Coal Co. and West Virginia University are studying use of psychological tests to measure ability and personality fitness of new recruits and present employees for supervisory, maintenance and machine operation jobs. Psychological tests can be a real asset in hiring or reassigning people but can also be a hidden liability if not properly handled.

**Highlights**—Photo of Air Force's two-hand coordination test device; chart showing results from its use at Ireland mine.

# ► Supply Handling

Simpler Supply Receiving ..... p 73

George E. Toles

Clinchfield Coal Co., Dante, Va., speeds up supply receiving through the use of a continuous register which permits receiving clerk to prepare all necessary papers in a single writing.

Added Feature-Specifications of receiving forms.



# ▶ Stripping and Preparation

Faster Stripping, Simpler Cleaning
Boost Efficiency p 74

Stripping 3,500 tpd from two seams near Harrisburg, Ill., Saxton Coal Corp. uses new 10-yd dragline mounted on single crawlers, reportedly the largest such unit. Faster hoist and drag motions maintain high rate of production, even though each bucketful of rock interval between seams must be hoisted clear out of pit because of nearby spoil from top-seam stripping. Preparation plant is built alongside loading tracks, instead of over them, to reduce plant height. Clean coal is conveyed to loading tower.

Noteworthy Extras—Description of test shot using loose ammonium nitrate granules in wet holes; dewatering fine coal in 35-tph centrifugal machines.

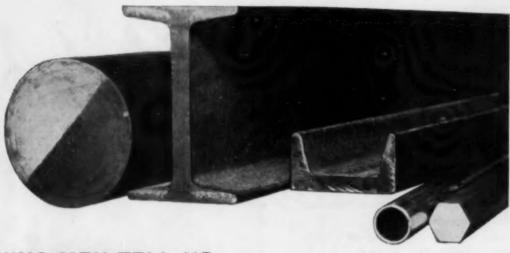
# Overseas Technology

Commercial Gas from Brown Coal . . . . . p 81

Good quality gas made from brown coal briquettes is now being piped 103 mi in southeast Australia, from the brown-coal mining area in Latrobe Valley to metropolitan Melbourne. The gas is being produced by the Lurgi high-pressure gasification process at the Morwell

(Continued on p 7)

COAL AGE September 1817, Vol 62, No. 9. Published on the 1st with additional inns in Mid-July by McGrew-Hill Publishing Co. Inc. Publication effect, 1899 Noble 81, Philadelptia 22, Pa. United States subscription rate or enderth, 189 to the Seld of the publication 82 pp. United States subscription rate or enderth, 189 pp. year; single copies 81, Second class mailing privileges authorized at Philadelptia, Pa. For additional information see p 11. Postmanter: Please cond Form 3579 to Cani Ase, 330 W. Atzad Ge. New York No. No.



MINING MEN TELL US ...

# 3 major reasons keep them coming to Ryerson:



Flame-cut steel shapes save you money—
one piece or hundreds—almost die-cut accuracy.

- 1. Biggest stocks—nobody comes even close to the size and variety of Ryerson inventories.
- 2. Unequalled processing facilities—assuring fast, accurate service on any requirement.
- 3. Dependable, certified quality—at fair prices—whether steel is plentiful or scarce.

# RYERSON STEEL

#### PRINCIPAL PRODUCTS IN STOCK

CARBON STEEL—bars · structurals · plates · sheets

STAINLESS—Allegheny Metal pipe • tubing • sheets • plates

ALLOY STEEL—including case hardening, direct hardening, heat treated and Rycut free-machining leaded alloys.

OTHER PRODUCTS—safety plate \* grating \* expanded metal \* chain \* wire rape \* reinfarcing bars \* plastic sheets \* pipe & tubing \* machinery & tools.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK . BOSTON . WALLINGFORD, CONN. . PHILADELPHIA . CHARLOTTE . CINCINNATI CLEVELAND . DETROIT . PITTSBURGH . BUFFALO . CHICAGO . MILWAUKEE . ST. LOUIS . LOS ANGELES . SAN FRANCISCO . SPOKANE . SEATTLE

#### This Month in Coal Age-Cont'd

plant of the Gas & Fuel Corp. of Victoria. Output—initially programmed at 15 million cu ft per day—will be quadrupled by 1965. Future plans call for using brown coal to make metallurgical coke and liquid fuels.

Featured-Plant components.



# **▶** Deep Mine Haulage

Designing a Haulage System ..... p 84

W. N. Poundstone, Superintendent, Christopher Coal Co., Osage, W. Va.

The three major factors that dictate the selection of a haulage system for any operation are job requirements, mining conditions, and operation and maintenance of the system. Taking all these factors into consideration, a three-phase haulage system—shuttle cars, rope belts and mine cars for main haulage—was chosen for Humphrey No. 7 mine, which will produce 12,000 tons with continuous miners at the face.

Sidelights—Improving the shuttle-car cycle and making modifications in rope-belt conveyors to improve haulage results.

# Overburden Preparation

Mechanical Tamping of Blastholes ..... p 88

Horizontal 60-ft blastholes are loaded and stemmed at a rate of three holes in 25 min at a Peabody property in Illinois, using a Payne load-tamp machine designed by a company official. A jointed tamping rod is stored on a reel which is mounted on a tractor. Turning the reel projects the rod into the blasthole or retracts and stores it. The reel is driven by a 4.5-ft-lb torque motor. One man in four days now can do the work formerly done by two men in five or six days.

Sidelights—Full description of how the machine is designed and how it is used.

(Continued on p 11)

# This Month in Coal

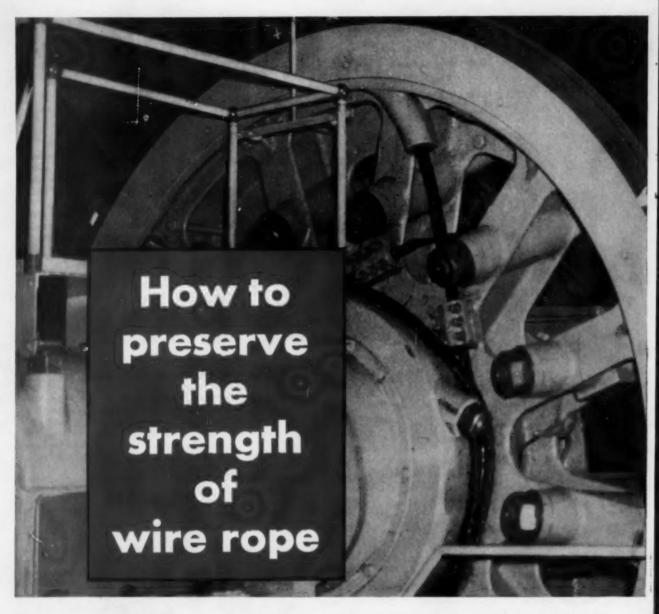
GROUND-GAINING PERIOD—With the turning of the production corner in August, marking the complete recovery of the tonnage losses incurred at the start of the year, bituminous coal entered into its 1957 ground-gaining phase. In this period it would have to average only 10 million tons a week to equal the 1956 production, leaving the major question as "How much more?" If the September-December, 1956, level is maintained or exceeded, the increase could reach 5 million tons—and perhaps 10 million or more.

s STAYING POWER—After a discouraging first 4 mo, anthracite began picking up. It came out of the vacation period only 5% behind 1956, and was still reducing the deficit as it went into September. If it, too, only approximates the pattern of the last of 1956, it could come close to equalling last year's output.

NO CUTBACK—The pace of mine construction and improvement continues high as bituminous approaches the fourth quarter of 1957, in turn leading to continued speculation concerning the relation between mine capacity and demand in the next few years. If output increases in accordance with certain forecasts, there will be no particular problem. If there is only a modest rise, the problem of excess capacity could become troublesome. But since the high rate of increase still is a notunreasonable bet, the conclusion is that there will be no cutback in expansion and modernization programs for this reason in the foreseeable future.

REAL IMPORT CURB?—Signs multiplied in August that the administration's latest attempt to control the volume of crude imports into the United States is meeting with some success. But it was still short of the goal of not over 1,031,000 bbl of crude importations per day because of the many exemptions in the original order and because of requests for relief from companies included in the program. Also, the impact of the order was softened by the fact that products—particularly residual oil—were exempted from any control, and thus could be used as a substitute for at least part of the crude shipments. Thus, the success of this second attempt at voluntary limiting the flow of foreign oil into the United States remained in doubt.

NO CRASH NUCLEAR PROGRAM—The second attempt of the public power group to get Congress to authorize government construction and operation of nuclear power plants ended in failure in the 1957 session. However, supporters of the program, who wanted \$400 million the first time and \$158 million the second undoubtedly will be in there fighting in the next session, and will be actively soliciting support in the interim. One reason for the lack of success of the public-power group so far has been the AEC's preference for private construction and operation of nuclear plants. In line with this principle, the commission is asking for proposals from the utilities and other interested groups and is preparing to issue construction licenses for a few such facilities.



You can keep wire rope strong longer by using a lubricant that protects every strand—and surrounds and preserves the core.

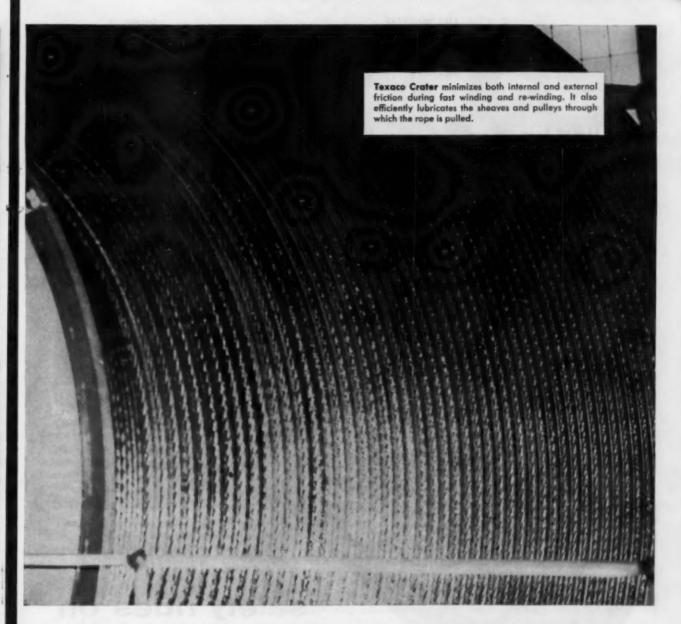
Use Texaco Crater. It does both of these jobs effectively. It penetrates the rope—encloses and seals the core. Its protective film prevents both rust and corrosion—minimizes wear by reducing both internal and external friction. In addition, it is sufficiently adhesive

to cling to the strands and provide long-lasting protection.

You can use *Texaco Crater* on hoist lines, power shovels, draglines and slusher ropes. You'll find it's economical protection—especially so when you compare the low cost of lubrication to the high cost of downtime and replacement.

Texaco Crater is ideal, too, for open gears.





It stays on the teeth-protects gears against wear by cushioning shocks and heavy loads.

Texaco Crater X Fluid offers you the application ease of a spray-on lubricant for both gears and wire rope. It has all the protective properties of regular Crater.

For mine car wheels, use Texaco Olympian Grease. It stays in the bearings—insures easy starts at any temperature and protection

against wear, dirt and moisture.

A Texaco Lubrication Engineer can help you cut maintenance costs with an efficient lubrication program. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

# **LUBRICANTS** for the Coal Mining Industry



safety rides on quality wire rope

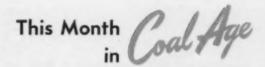
You may never hoist loads as large as this 120-ton drum. But safe, top quality wire rope is just as important to your own operations. For, although the price of a "bargain" rope would be less, failure of such a rope could cost you thousands of dollars in wrecked equipment. Don't be a victim of false economy. Buy a wire rope that's a quality rope—buy Wickwire Rope.

....



LOOK FOR THE YELLOW TRIANGLE PRODUCT OF WICKWIRE SPENCER STEEL DIVISION THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque « Amarilla « Billings » Boise » Butte » Casper » Denver » El Paso Farmington (N. M.) » Fort Worth « Houston » Kansas City » Lincoln (Neb.) » Odesse (Tex.) « Oklahoma City » Phoenix » Pueblo Selt Loke City » Tulsa » Wichita » PACIFIC COAST DIVISION—Los Angeles » Oakland » Portland « San Francisco » San Leandro Seatife » Spokene » WICKWIRE SPENCER STEEL DIVISION—Boston » Buffelo » Chattanooga » Chicago » Detroit » Emlentom (Pa.) New Orleans » New York » Philadelphia



#### CONTINUED

# **▶** Barge Loading

How Armco Barge Plant Rebuilt for Higher Capacity . . . . . . . . . . . p 90

New conveyors raise capacity to 900 tph, compared to 250 tph when plant was first built 17 yr ago. Loading is done over spar barge and changes in water level are accomplished by telescoping conveyors on inclined track and eventually hoisting one out of the system.

Added Feature—How temporary Chutes are used to lengthen the system pending completion of a new dam raising pool level 10 ft.

Editorials ..... p 69

Capacity and coal demand in 1960; oil-import restrictions.

The Coal Commentator . . . . . . . . . . . p 12

Processing coal for chemicals; the contributions of the late Charles A. Owen to coal progress; M/S AC-CIAIERE and her meaning in the export picture; the human element in safety; natural gas prospects. Foremen's Forum ..... p 94

Going back to school? Can coal move up this ladder?

Operating Ideas ..... p 98

How to install oil seals properly; reflective signs promote safety; recovering thin seam in Germany with underground auger.

Equipment News ..... p 102

Products for the Deep Mine—Semiautomatic bit grinder; explosives bags; hanger tester; fault locator for trailing cables.

For the Strip Mine—Rock rippers; drag-bit drill head; front-end loaders.

Preparation and Services—Screen for use where flats and slivers are encountered; sand and slurry pump; tapes for splicing and terminating plastic or rubber cables; elbow fittings for hose assemblies.

News Roundup ..... p 126

Dissatisfied with the freight rate increase just granted, rails prepare to seek a new increase; the first ship of a coal-carrying fleet built by Finsider, the Italian steel combination, arrives in Norfolk; a report on direct ore reduction; the fight in Washington over public power vs private power—this time with the atom in the middle; Koal Krudes char plant goes on stream; and the Harris gas bill waits off-stage.

CARL COASH, Publisher

IVAN A. GIVEN, Editor

Harold Davis
Managing Editor

A. E. Flowers
Associate Editor

W. A. Raleigh, Jr. Assistant Editor Daniel Jackson, Jr. Assistant Editor

Christopher Elias Assistant Editor

F. A. Zimmerli Art Director G. B. Bryant, Jr. Washington W. H. McNeal Circulation Manager Raymond H. Smalley Business Manager

D. C. McGRAW JR., Advertising Sales Manager

NEWS BUREAU OFFICES: Atlanta 3; Cleveland 15; Detroit 26; Houston 25; San Francisco 4; Washington 4. WORLD NEWS OFFICES: London, Paris, Bonn, Tokyo, Bombay, Rio de Janeiro, Mexico City

COAL AGE VOLUME 62 SEPTEMBER, 1957 NUMBER 9

COAL AGE, with which are consolidated The Coelliery Engineer and Mines and Mineral, in published monthly on the lat with an additions Mining Gaidebook number in Mid-July by McGraw-Hill Publishing On, Inc., James H. McGrav (1896-1948). Founder, PUBLICATION OFFICE of the Committee of the Committe

EXECUTIVE EDITORIAL CIRCULATION and ADVERTISING OFFICES, 330 West 42d 8t., Now York 30, N, Y. Donaid C. McGraw, president; Joseph A. Gerardi, executive vice president; L. Kelli Goodrich, vice president and treasurer; A McGRAW-NEE PUBLICATION

e president, Publications Division; Balph

sales; A. R. Venenian, vice president and circulation coordinator,
Subscriptions are solicited only from executives
management, ongineering, operating and supervicery efficials associated with companion engaged in
the mining and preparation of anthreaits, bituminous and lignite cool. Position and company
connection must be indicated on subscription
arders. Sould to address shown in the box below.
U. S. and possessions and Canada, subscription
rate for individuals in the field of the publication 85 per year, single copice \$1; eleewhere \$15

wriers. Soud to addrose shown in the bax below. U. S. and possessions and Canada, subscription rate for individuals in the Seld of the publication of the property of the private state of the property of the private state of the publication of the private of the publication of the private of the publication of the pu

SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, COAL AGE, 330 West 42d St., New York 36, N. Y. Subscribers should notify publisher promptly of any change of address, giving

old as well as new address and including postal sons number, if any, If possible, exclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

# The Coal Commentator

# **Processing Promise**

Gradually but definitely coal is moving farther into the chemical field as a result of action both within and without the coal-producing fraternity. An example of coal-industry action is the Pitt Consol char plant being built in connection with the Kammer power station, near Wheeling, W. Va. Independent action includes the new Koal Krudes plant, at Red Lodge, Mont., details of which appear

in the news section of this issue.

If results are up to expectations and there is good reason to feel they will be-the Red Lodge-Bear Creek coal field will get a new lease on life after a series of blows that had almost wiped it out. At the same time, the faith of some of the pioneer developers-and of their present-day successors-in the ultimate role of the area in the industrial economy of the West will be vindicated. One such pioneer was the late James F. Brophy, whose 1906 Smokeless & Sootless mine was a predecessor of the present Brophy Coal Co., which is supplying the new char plant. He long maintained that coal processing, of the right type, held real promise for his field, as well as for others. As the promise is realized, both at Red Lodge and Wheeling, and at other plants yet to be built, coal will gain a broader and broader market.

#### Charles A. Owen

Coal today owes its position and its prospects to the contributions of many men, and it detracts nothing from their accomplishments to note that Charles A. Owen, whose death July 22 ended nearly half a century in coal, occupied a rather special

position in the industry.

Building up a highly successful mining and marketing organization was only one of his contributions to the advancement of the industry. Equally or more important was his active participation in the development and operation of key organizations playing vital roles in industry affairs, including the Central Pennsylvania Coal Producers' Association, The Eastern Bituminous Coal Association, the Coal Exporters Association of the United States, and, of course, the National Coal Association, plus the United Mine Workers Welfare and Retirement Fund. In all his activities, he made friends wherever he went.

His loss is a real one, but at the same time the coal industry is a stronger, more-progressive in-

dustry through his activities in it.

#### Welcome Arrival

M/S ACCIAIERE arrived at Norfolk Aug. 9, and in so doing highlighted once again the importance of United States coal in the economies of nations abroad—in this particular instance Italy. Under the attentive and admiring eyes of a special welcoming group organized by Raoul Ferreri, U.S. representative of Societa Finanziaria Siderurgica (Finsider), ACCIAIERE began loading a cargo of metallurgical coal mined by Eastern Gas & Fuel

Associates; sold by Castner, Curran & Bullit, Inc., EG&FA export sales subsidiary; and hauled to the coast by the Virginian Ry.

Finsider is an organization of the largest Italian steel producers, representing 80% of the country's pig-iron and 52% of its crude-steel production. This makes the vote of confidence in the U. S. product a real one. ACCIAIERE is the first of a new fleet of six vessels being built for the steel group. They will carry the major portion of the 1,500,000 tons of American coal needed yearly by Italian steel plants.

A hearty welcome to ACCIAIERE and all her sisters. May their continued arrival be the outward sign of a long-enduring and mutually

beneficial relationship.

# Overriding Goal

Man himself is perhaps the only outstanding uncontrollable factor-so far-in achieving safety, whether on the highway, in the home or in the mine. This becomes plainer and plainer as progress is achieved in physical safeguards. The June record in the Pennsylvania bituminous mines is a case in point. Six fatalities were marked up. Four of these were the clear and direct responsibility of the men who were killed. In the cases of the other two, no responsibility could be placed on any particular person.

Stress on making the plant and equipment safe is necessary stress, but it sometimes leads to preoccupation with the physical side when more attention should be paid to the human element. Conditioning is the final answer, though the saying is easier than the doing. But the ultimate in safety cannot be achieved until men are trained and conditioned to do the safe thing automatically. That should always be the overriding goal in safety work.

#### More to Come

Although one swallow doesn't make a summer, and one sales drop in one month doesn't mean a permanent reduction, it is refreshing to see one's most annoying competitor stumble occasionally. This is industrial gas which, in May, 1957, according to the "Monthly Bulletin of Utility Gas Sales" of the American Gas Association, dropped 2.4%, compared to May, 1956. The drop is even more noteworthy in view of the fact that increases averaging over 5% had been marked up in the previous months of the year. And any change in the industrial gas picture takes on added importance when it is considered that, in addition to being one of coal's most serious challengers, industrial gas represents over half the total sales of this particular fuel.

June may find industrial gas back in the groove. But it cannot get away from a growing problem-the increases in wellhead prices, in transportation rates and in other costs. Here coal has a clear advantage. More and more, therefore, months can be expected in which industrial gas sales will

drop-if coal plays its cards right.



# Fights Deposits!

SINCLAIR

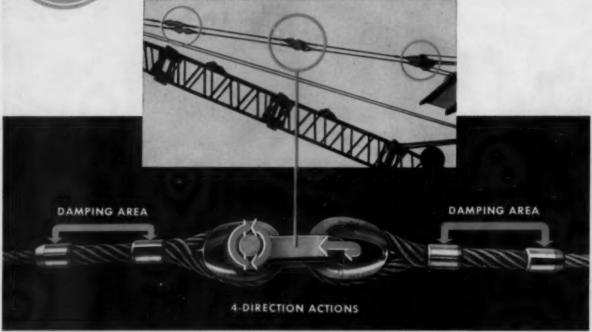
Keep out power-robbing deposits in your heavy duty Diesels. Refill with Sinclair SUPER TENOL® for the tough jobs! It helps to eliminate deposits of carbon, varnish and sludge that impair engine efficiency. SUPER TENOL is specially engineered to fight the effects of high temperature, engine over-load and continuous stop-and-go operation. Your engines last longer!

Refill now with Sinclair SUPER TENOL. Contact your local Sinclair Representative or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

SUPER TENOL MOTOR OIL



# ACCO Registered Dualoc Boom Cables



# Why You Need ACCO Registered Boom Cables on Your Equipment:

# ... Every Buckled or Dropped Boom Results from Boom Cable Failure

Failure results from either overloading or fatigue. You can avoid overloading, but fatigue occurs every time vibration is stopped suddenly in a wire rope and it is practically impossible to measure how badly the rope is fatigued before failure occurs.

Because vibration in a boom cable occurs in more than one plane, any type of connector which can move in a single plane only, forces the wire rope to stop vibration in all other planes. Therefore, fatigue is set up.

Acco Registered Boom Cable Connectors give movement in FOUR DIRECTIONS and thus change fatigue to wear, which can be measured easily.

To decrease the amount of this wear and to

absorb any vibration which might not be handled by the connectors, acco Registered Boom Cables use the damping action of the patented DUALOC ending which absorbs the vibration over a considerable area without dangerously localized fatigue.

ONLY ACCO REGISTERED BOOM CABLES protect your investment through their following Exclusive Features:

- 1 FOUR-DIRECTIONAL MOVEMENT
- 2 DUALOC VIBRATION DAMPING
- 3 WARRANTED STRENGTH
- 4 CERTIFIED PROOF TEST

**Trade Mark Registered** 



Write today

for your copy of Catalog DH-220 which includes complete information, including dimensions and breaking strengths on the complete line of ACCO-Registered DUALOC Boom Cable assemblies.



# AMERICAN CHAIN & CABLE

Wilkes-Barre, Pennsylvania

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn. In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.





There are two reasons why Kensington tracks give longer service, even under the severest working conditions.

First, vastly improved design.

Second, they are made from a superior, wear-resisting alloyed manganese steel.

New design. Kensington tracks have only three parts...the rail, the grouser, and the pin. Rails are cast in one piece to add strength and prevent wear caused by the constant twisting and weaving found in ordinary tracks.

Grousers have anti-shear lugs which fit snugly over the tie bar of the link to eliminate loose plates, elongated bolt holes, and side-sway. Grousers are heavied-up at all critical points to better resist bending and breaking.

Pins, constructed of a special alloy, are pressed tightly in place under high pressure to give further rigidity and near-perfect alignment.

Yet, even with all these design improvements, Kensington track assemblies fit all standard, popular make crawler tractors.

Steel with stamina. Development of several remarkable wear-resisting alloyed manganese steels, including Ono Supermang and Kenkrome, has also increased the wear-ability of Kensington tracks. These already-hard metals actually fight back against wear! They develop extra surface hardness when exposed to friction, abrasion, or impact. Yet, under this ever-hardening "skin,"

these metals stay tough and strong. That's why Kensington uses Kenkrome in its rails and Supermang in its grousers.

Economical, too. Though Kensingron tracks cost slightly more than those supplied by the tractor manufacturer, they enable you to make substantial savings.

They give you many more hours of service per dollar of cost, less time lost for maintenance, and increased operating efficiency because Kensington tracks keep their "pull-bracing grouser area" for a longer period of time. Also, you can maintain a smaller inventory of repair parts.

Discover for yourself how many hundred dollars these tracks will save you over the next few years.

Other wear-resisting Kensington replacement parts

#### **CRUSHER PARTS** FOR TRACTORS Jaw plates, roll shells, mantles Kenkrome replace and bowl liners, hammers, ment rims for worr grate bars and liners, etc. sprockets. Ready to weld on. FOR SHOVELS CHAIN AND SPROCKETS Treads, rollers, rack and teeth. 150 standard chains listed in new KEN-SINGTON Catalog plus many special to fit all star ard shovels chains. All of weardefying Kenkrome.



KENSINGTON STEE	L, Dopt. C, 505 Konsingle	n Ave., Chicage 28, Ill
	on on crawler tracks fo will be under no oblig	
Make of Tractor		
11.4.)	NO. TRACKS	WIDTH OF
Model	PER BELL	
	PER BELI	
NAME	PER BELL	
Model  NAME  COMPANY  ADDRESS	PER SELI	

# New specialized off-highway V-8

# Another reason why you'll find

# International Trucks cost least to own!

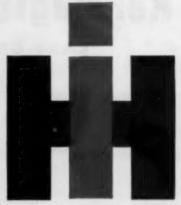
A new six-wheeler designed exclusively by International for heavyduty off-highway work—with the most powerful truck-type engine in any comparable truck. Tough, husky construction to perform profitably under the most rugged conditions!

Here is more evidence of the INTERNATIONAL policy to build the trucks that operators want and need ... trucks with only the highest qual-

ity components, the biggest selection of components to stay on the job longer at *least* cost. And International Trucks do cost *least* to ownfleet owners' cost records prove\* this.

Why not get proof yourself? See or call your International Dealer for all the facts. Do it today.

\*Signed statements in our files, from fleet owners throughout the U.S., back up this statement.

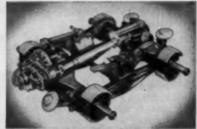


INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



1 Most V-8 power in any truck, 257 hp. New Heavy-duty VF-230 models have load-moving ability unlimited, power to haul the biggest loads. Other six-wheeler engines include sixes and new V-8's-gasoline, LPG and diesels up to 356 hp.



2 International tandems give longer, more dependable life. This heavy-duty, double reduction unit has 50,000 lbs. capacity. Sturdy cast steel housings. Third differential with lock transmits power smoothly and evenly to each axle.



3 Balanced heavy-duty front end for maximum loading, added stability and longer life. 15,000 lbs. capacity heattreated high carbon steel axle, 4-inch wide springs, threaded pins and bushings. Built to take the big jobs in stride.



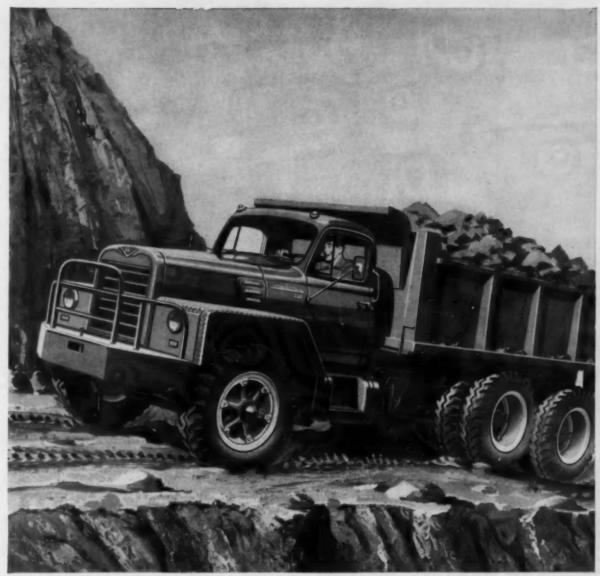
4. INTERNATIONAL steel-flex frames combine great strength with proper flexibility. New models have deep, double channels made of heat-treated alloy steel. Reinforced cross-members with husky gussets for sturdy, lasting tandem suspension.



5 Efficient, fast-acting air brakes are standard on Heavy-duty VF-230-17½ in. x 3 in. front, 16½ in. x 7 in. rear with 1,162 sq. in. total lining area. Other six-wheel models with brake types and sizes to match load and operation exactly.



6 True geometric steering provides easier handling and outstanding maneuverability. Heavy-duty gears are cam and roller mounted twin lever type. Controls mounted ahead of the front axle. Power steering standard on this new model.



Latest addition to the world's most popular line of sixwheel trucks—new International Heavy-duty VF-230 with 60,000 lbs. GVW. Built to absorb severe shock loads, to stand up under the most extreme applications. Engine

is the industry's most powerful V-8, 257 hp. Other new off-highway V-8 six-wheelers available, plus models from 22,000 to 76,800 lbs. GVW in conventional and COE design. Complete selection of all-wheel-drive models, too.



7 Heavy-duty, functional construction. Fenders are 12 gauge diamond tread steel plate, welded and reinforced for extra strength and long life. Massive, sturdy bumpers and guards. Rugged reinforced support for front tow pin.

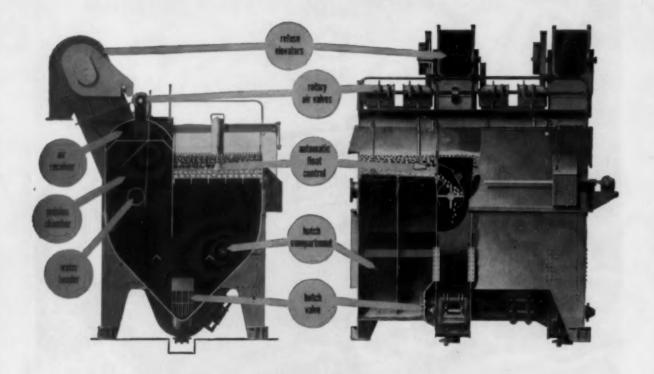


8 INTERNATIONAL also offers a complete line of all-wheel drive models for the tough, off-highway operations. Completely factory-built, 7,000 to 43,000 lbs. GVW Low height with ample ground clearance. Complete selection of equipment available.



■ World's most complete line. There is an International "tailor-made" for every job, half-tonners to 96,000 pounders. Choice of 4-wheel, 6-wheel and all-wheeldrive models, conventional and COE design. Every one built to cost least to own!

# AIR-OPERATED JIG



Shown is a Jeffrey 84-inch, two-compartment, four-cell, air-operated Baum Jig. Also available are three-compartment, six-cell or eight-cell jigs and two-compartment, five-cell.

AIR CYCLE: At the beginning of each stroke a rotary valve admits compressed air to the pulsion chamber. A rapid build up of pressure causes a rapid upward acceleration of the water that lifts the bed of particles in a mass. As the valve continues to turn, it cuts off the incoming air. Then the air in the chamber expands. As the pressure drops, the upward acceleration of the water decreases and the bed of particles opens. Finally as the valve continues to turn, the air is exhausted and the actual separation takes place . . . all on the down stroke.

This down-stroke separation is a distinctive feature of the Jeffrey jig. It makes for effective separation over a great size range, such as 8" x 200 mesh. In fact, in contrast to competitive jigs, completely unsized feeds are preferred.

JIG BED AT OPERATING GRAVITY: The Jeffrey air cycle builds up to bed density in the jig to the operating gravity. There it is held constant by a float

For detailed information, get in touch with
THE JEFFREY MANUFACTURING COMPANY
Columbus 16, Ohlo

control. The result is a dense-medium separation over the whole size range.

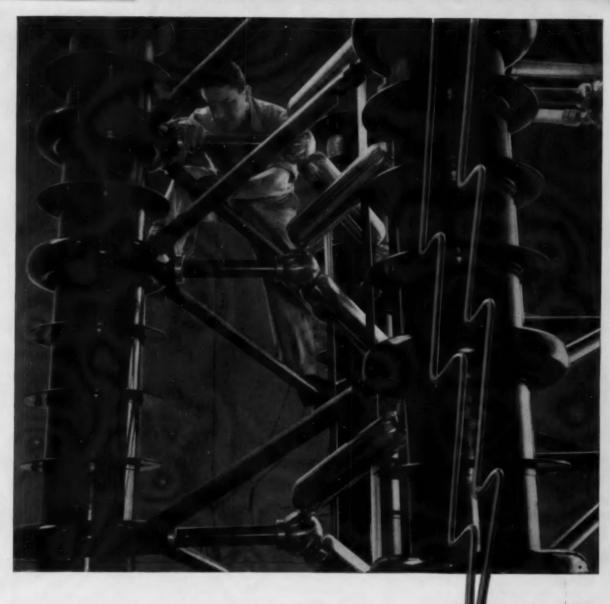
NO END-WALL DISTURBANCES: Ordinarily, circulation along end walls causes the products withdrawn from a jig to be very much poorer than actually stratified in the jig bed. In Jeffrey jigs this defect, inherent in the jigging process, is overcome by a simple arrangement at the end of each compartment.

LOW WATER: The amount of circulating water required is a minimum, just enough to transport particles over the jig.

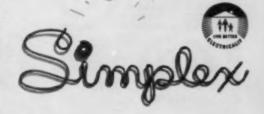
HIGH UNIT CAPACITY: The capacity of this jig is exceptionally high per unit of area, much above that of any competitive jig.

CLOSED CIRCUIT CRUSHING: This jig is ideal for a circuit involving preliminary washing combined with recrushing of middlings. The crushed middlings are simply returned to the same jig for rewashing. Such a circuit is very simple.





Simplex Wire & Cable Company's new 1,400,000 volt impulse generator — the first of its kind to be installed in North America — represents just one aspect of research at Simplex. Simplex scientists and engineers originated the process of vulcanizing portable rubber cords and cables in a lead mold. Simplex developed the first heavy-duty portable electrical cable — Simplex TIREX. The first truly moisture-resistant rubber insulation was the outcome of a commercially acceptable method of deproteinization developed by Simplex. Simplex designed the first interlocked armored cable for underground service — Simplex CONDEX. And now — Simplex C-L-X — the portable, corrugated metallic duct WITH SEALED-IN CABLE. SIMPLEX WIRE & CABLE CO., Cambridge, Massachusetts and Newington, New Hampshire.



Highest quality cables for: Mining . Power & Lighting . Construction . Transportation . Communications . Signalling

# NEW CARMES "G"SERIES

# CARBIDE BITS for CONTINUOUS MINING MACHINES

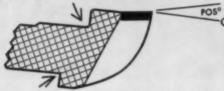


## CARMET DISTRIBUTORS

Brace-Musitor-Huntley, Inc.
Offices: Buffale, Rechester & Syracuse, N. Y.
Carbon Transfer & Supply Co., Helper, Utah
Carlsbad Supply Co., Carisbad, New Mexico
Consolidated Supply Co., Picher, Oklahoma
Crandall Engineering Co., Inc., Birmingham, Ala.
Drillmaster Supply & Mig. Co., Evansville, Ind.
Gladstoin Co., McAlester, Okiahoma
Lonchburg Supply Co., Loechburg, Pa.
Marion Mine & Mill Supply Co.,
Whitowell, Tennessae
McCombs Supply Co., Jellice, Tonnessae
Oglehay, Norton Mine Supply Div.,
St. Clairsville, Ohio
Persinger Supply Co., Williamson, W. Va.
Persinger's Inc., Charleston, W. Va.
Union Supply Co., Denver, Colorade
U. S. Stoof Supply Co., Pittsburgh, Pa.
W. B. Thompson Co., Iron Mountain, Michigan

Write for your copy of "CARMET MINING TOOLS" ADDRESS DEPT. CA-93

Forged-in hook angle prevents slip, in order to provide for fast bit removal. NO STUCK TOOLS.



Forged from alloy steel and heat-treated: shank is 1/2" x 1" in size, with 11/4" GAGE STOP.

The strongest cutting tip designed: Tip rake angles furnished to suit any cutting conditions. Strong tip support allows use of a harder, more wear-resistant grade of carbide for longer tool bit life, more regrinds, less down time. Strong braze material provides protection against tip loss.

Here's what a major mining company in Pennsylvania says: "Carmet has proved to us that all carbide bits are not the same. We have reduced our bit costs by at least 25%. Carmet is saving us money every day!"

Carmet's years of experience in developing bit and shank materials, designs and fabricating techniques will pay off for you, too. In addition to

the new "G" Series for continuous mining machines, Carmet distribu-tors can offer you the widest line of carbide cutter and drill bits in the industry.

• Let them show you the Carmet way to lower tool cost and increased production. Allegheny Ludlum Steel Corporation, Carmet Division, 1500 Jarvis Avenue, Detroit 20, Michigan.

The Original DOUBLE-BONDED Carbide Bit







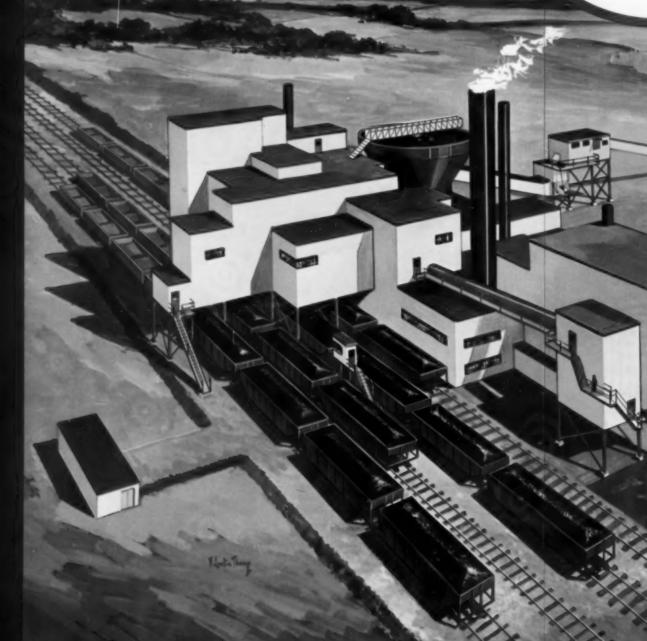
# ROYALTY

Crowns the achievements
of the men who know coal
from the ground up

For Know-how

River K

FREE



Ask the Men from

Achievement er King Plant body Coal Co. RIVER KING PLANT

rom

ACE HIGH WITH.



Located on the Mississippi River, this Barge Loading Station for the River King Plant loads barges at the rate of 1500 tons per hour.

McN

# THE KING AND QUEEN OF COAL





Here is the ro monarch of fu Illinois, and every refineme fuel preparatis Truly the pl King, and Riv

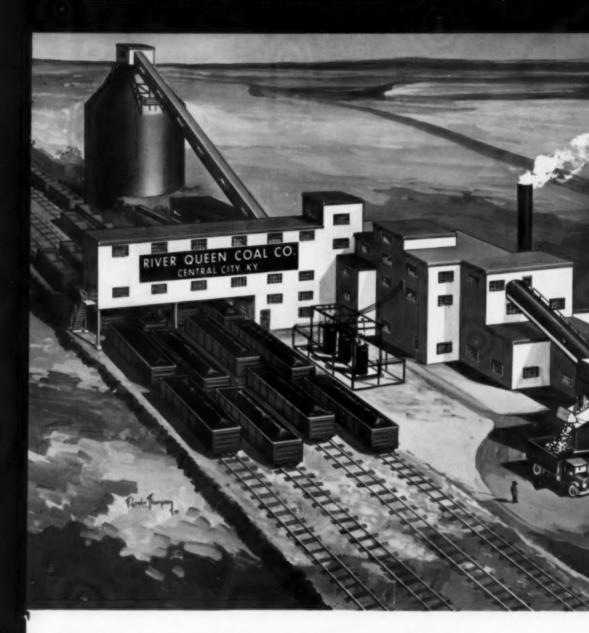
The RIVER KING-Three McNall of 6" x 0" coal 1 tion from a 50 a McNally Pitt fuels go to tw truck loading tracks where cars into posit FIRST CLASS PERMIT No. 93 (Sec. SAL, P. L. & R.) PITTSBURG, KANS.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c-POSTAGE WILL BE PAID BY—
McNally Pittsburg Mfg. Corp.
PITTSBURG, KANSAS

The River Queen's Barge Loading Station at Central City, Kentucky, delivers prepared fuel to the weighing and sampling station, thence to barges on either side of the dock at 1000 tph.

# McNally Pittsburg



Here is the royal way to handle and prepare the monarch of fuels. These new plants at Freeburg, Illinois, and Central City, Kentucky, represent every refinement to step up the efficiency of fine fuel preparation. They are prepared for the future. Truly the plants deserve their names—River King, and River Queen.

#### The BIVER KING-

Three McNally Norton Washers handle 1000 tons of 6" x 0" coal per hour fed in a continuous operation from a 5000-ton capacity storage pile through a McNally Pittsburg Rotary Breaker. Specification fuels go to two 400-ton capacity storage bins for truck loading, or for loading freight cars on two tracks where two 30-car capacity car hauls draw cars into position.

#### The RIVER QUEEN-

Heart of this operation is a McNally Giant equipped with a crusher and rewasher. I city is 1000 tons per hour—taking raw coa to 4" x 0" by a McNally Pittsburg Rotary

Prepared fuels go to loading-out conveyor ton capacity storage bin. Separate or sin ous loading on two tracks is provided by to capacity car hauls which draw in empty adjoining tracks for subsequent loading.

These two plants are not alike because engineered to the needs of the locality, the and the requirements of the market. In both accomplish the same purpose—mupgrading—maximum fuel recovery—m profits with low maintenance costs.





lly Giant Washer washer. Its caparaw coal broken Rotary Breaker. conveyor, or 4000te or simultaneded by two 30-car nempty trips on loading.

because they are cality, the seam, tarket. Yet they pose—maximum very—maximum sts. The plant differences demonstrate McNally Pittsburg's business—bringing years of experience to the solution of fuel preparation problems. Our Know-How and our facilities are not limited to a single type of washer or dryer. We manufacture all desirable types—and can recommend the best for any mine—any seam—any market requirements anywhere.

For information on complete plants or parts, send postcard today.

Ger	ntl	en	ne	nı
		-	-	

We need information on a complete new plant that

will wash\_\_\_\_inches by 0 at\_\_\_\_tons per hour and dry

\_\_\_\_inches by 0 at\_\_\_\_tons per hour.

Send information on the following special equipment:

Name\_\_\_\_\_Title\_\_\_\_\_

Company\_\_\_\_

City and State\_\_\_\_

☐ Have Sales Engineer call for further consultation.

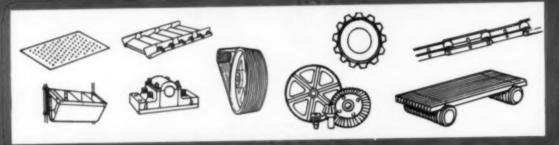
for COMPLETE PLANTS



for EQUIPMENT



for PARTS ...



Ask the men who know coal from the ground up

FROM THE GROUND-TO THE CARRIER-From "crude" coal to any desired fuel refinement-large or small-alow or fast-The Men at McNally have the KNOW-HOW-Have Done It-for CREATER PROFITS for McNally customers.

M'NALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNelly Pittsburg Manufacturing Corporation — Manufacturing Plants: Pittsburg, Kenses - Wellston, Ohio Engineering and Sales Offices: Pittsburgh - Chicago - Rio de Janeiro - Pittsburg, Kenses - Wellston, Ohio

If you want the BEST

Specify

Teeth that really dig



when you purchase new equipment



TOOTH COMPANY

1540 SOUTH GREENWOOD AVE. MONTEBELLO, CALIFORNIA

# KOEHRING WORK CAPACITY in action ...



21.5 mph Cruiser® — One man controls all operations, one engine supplies all power for work and travel on Koehring 205 Cruiser crane. There's a full range of low working speeds up to 7 mph — plus travel speeds up to 21.5 mph. It has smooth torque-converter drive, power steering, 27½-foot turn radius, 30% gradability. Usefulness is unlimited in mines, pits, and quarries. 205 Cruiser lifts up to 15 tons — handles ½ to ¼-yard clamshell or dragline buckets on a wide work radius — converts to ½-yard shovel or hoe.

Swings a big bucket — Notice the size of this dragline, stripping a coal seam in an Eastern mine (below). It's the big Koehring 1205 — and handles 3 to 4-yard bucket, depending on weight of materials. Boom lengths: 60 to 170 feet. This big-capacity stripper also converts to 3-yard shovel. High-lift model has a 3-yard dipper on 40-foot shovel boom — or a 2½-yard dipper on 50-foot shovel boom.





Ship to shore - A pair of Koehring 405 clamshell cranes, mounted on a Great Lakes dredge — one of the world's largest — solved the problem of transferring sand from the ship's hold to shore. With this system, approximately 4,500 tons of sand are unloaded in 6 hours. Crane in foreground dumps into a Johnson Lo-Bin, mounted on flanged wheels. Lo-Bin travels along track, transports sand to a swinging, boom-type conveyor, which stockpiles it at dockside. On clamshell work, Koehring 405 handles 1 to 11/2-yd. buckets. Check its other capacities in chart on opposite page.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.



In heavy rock — Owner of this Southern mine needed a heavy-duty shovel to strip rocky overburden — picked a Koehring ¾-yard 305 for the job. Its powerful digging crowd, and rugged strength of deep-section boom and dual dipper sticks, proved more than a match for the heavy rock. Yet, in work like this, 90% power-assist on main drum clutches gives operator a light lever-pull and sensitive "feel" of load. Power, strength, stability as a shovel increase the 305's work capacity with all attachments. For proof, check its lift ratings (at left).

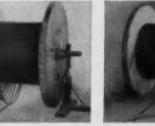
CRAWLER 445 (Crone 90,000 lbs. at 15 ft. radius ON RUBBER only) 40,000 lbs. at 25-ft. radius 605 72,300 lbs. at 12-ft, radius 116-Yds. CRAWLER 805 2-Yds. 104,200 lbs. at 12-ft. radius CRAWLER 1205 3-Yds. 190,000 lbs. at 12-ft. radius CRAWLER

West man information?





Here's the way to set up reel for unwinding The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



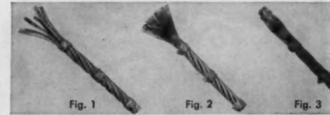
This reel is set up right

Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.



This reel is set up wrong

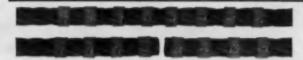
The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.



#### **Eight steps of correct SOCKETING**

1. Securely seize and serve with soft wire ties before cutting. and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket. 2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in Fig. 1 above. Untwist and broom out the wires. See Fig. 2.

3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha or gasoline. Then dip the wires in commercial muriatic acid, to a depth not greater than % of the cleaned length of wire. Keep them immersed for 30 seconds to 1 minute, or until the acid has thoroughly cleaned each wire. Be sure acid does not contact any other portion of the rope.



#### Follow these steps for PROPER SEIZING

Since practically all wire ropes today are preformed, we suggest that when cutting you put only one seizing on each side of the cut.

When cutting ordinary ropes, thoroughly seize (bind, serve or tie) so there will be no misplacement or relative movement of strands. For most ropes, other than preformed, three seizings should be used on each side of the cut. Four seizings on each side are required for a lang lay rope, or any rope having an independent wire rope core or a strand core. Four seizings are also needed for all 18x7 ropes, and all ropes larger than 1" diameter.

# Tuffy Special Wire Ropes are tailored to special use. Ordering is easy:



## **Tuffy** Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.







# Tuffy Dragline Rope

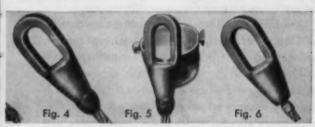
Constructed to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves, hugs the drum when casting for full load. Consistently dependable in handling any material - wet or dry dirt, sand, gravel rock, cement or minerals.





# Watch your steps

when you unwind, seize, clip, socket and reeve wire rope



 Dip the wires in boiling water containing a small amount of soda, to neutralize the acid.

5. Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

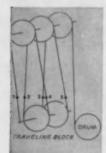
6. Insert the rope end into bottom of socket. Remove temporary tie wire.

7. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about ½ teaspoon of sal ammoniac crystals.

8. Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

#### REEVING

3



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts, plus the accumulation of friction on all sheaves. Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

## Attaching by CLIPPING



RIGHT WAY for greatest rope strength



Wrong Way: clips staggered





The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope. Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

# Just say Tuffy give length and size, and forget complicated specifications.

## **Tuffy Slings and Hoist Lines**

Here's the team that does a topflight job with every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible; can't be hurt seriously by knotting or kinking. Tuffy Heist Line is a special construction of super flexibility and toughness.



# Tuffy Dozer Rope

Constructed to give you longer service life with less downtime. 150' reels of ½" or 9/16" mounted on your dozers allow you to cut-off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!



# Ready Help in Your Wire Rope Problems... ASK YOUR UNION DISTRIBUTOR

Whether your wire rope need is a scheduled replacement or emergency requirement, your Union distributor is ready with "right-now" service. He keeps complete warehouse stocks of Union standard constructions and the Tuffy special purpose ropes. And he's backed by immediate service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. Just say the word!

If you don't know him already, see your classified telephone directory, under Wire Ropes or Slings.

union (S



3 Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

# **GULF QUALITY FUELS**

smooth the way
to top tonnage
for Diamond "T"
Coal Stripping
Company

Diamond "T" Coal Stripping Company produces about 350,000 tons of coal a year, at Philipsburg, Pennsylvania. Gulf quality fuels and lubricants help keep their equipment functioning smoothly, efficiently—with a minimum of down-time.

Jules Di Bernardino, in charge of maintenance, and Don A. Berlanti, who looks after equipment on location, say: "Gulf quality products and Gulf's prompt delivery service have kept us moving at peak production for the past ten years!" The firm expects to keep stripping coal in the Philipsburg area for another ten years.



#### AND LUBRICANTS

Diamond "T" operates a 15-yard drag line—and two others—five dozers, a Cat grader, a Champion Jay Drill, several giant loading shovels, five Turnorockers, twelve 15-ton dump trucks and auxiliary equipment. All this highly important heavy machinery depends on Gulf quality fuels and lubricants.

Like Diamond "T" Coal Stripping Company, you too can achieve maximum performance, lower overall operating costs and fewer mechanical delays. Your Gulf Sales Engineer can show you how. Just call any Gulf Office.



GULF OIL CORPORATION 1822 Gulf Building, Pittsburgh 30, Pa.





Demonstrating the size of the drag line bucket are: John De Ferdinand, Gulf Sales Engineer; J. W. Pritchard, Gulf Distributor, Philipsburg, Pa.; J. S. Buchanan, Gulf Direct Sales; R. L. Mc-Clenaken, Marion Shovel Erecting Engineer; Jules Di Bernardino, Vice President of Diamond "T" Coal Stripping Company.

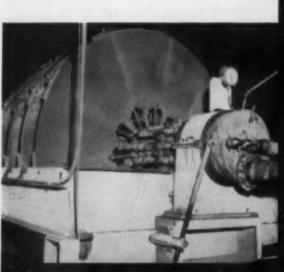
The largest drag line in the Philipsburg area, powered by a Cooper-Bessemer 750 H.P. engine, fed by tanks holding 2,200 gallons of Gulf fuel, with 385 gallons of Gulf lubricant protecting the engine. Diamond "T" Coal Stripping Company has been a Gulf user for ten years.

#### How Dorr-Oliver THICKENER - FILTER - PUMP TEAM

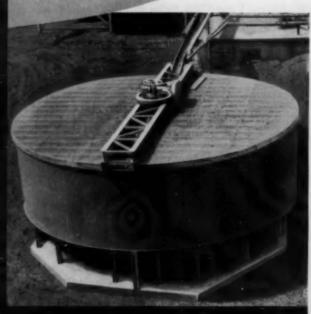
Recovers fine coal at

Buckeye Coal & Coke Company...

Washery process water clarified for reuse



6' dia. x 5 disc American Filter — valve end.



35' dia. Dorr Type A Thickener at Buckeye Coal & Coke Co.

By the installation of a fine coal recovery system in the coal washery plant, the Buckeye Coal & Coke Company, at their Stephenson, West Virginia Plant is now recovering 65 TPD of minus 18 mesh coal previously lost in plant effluent to the Guyandotte River.

Essentially the system consists of a 35-foot diameter Dorr Type A Thickener and a 6-foot diameter by 5 disc American Filter. Thickener underflow is handled by a No. 4 Oliver Diaphragm Slurry Pump; other D-O auxiliary equipment includes two Oliver

Type L Centrifugal Pumps.

Here's how it works. Drag tank overflow combined with centrifugal dryer effluent containing 4.5 TPH of minus 18 mesh coal is laundered to the Dorr Thickener. Underflow, concentrated to 40% solids, is then fed to the American Filter where the 65 tons of dewatered fine coal is recovered each day. Thickener overflow containing less than 1,000 ppm solids is recycled to head tank for reuse in washery. Filtrate is recycled to the Thickener.

If you have a problem in the recovery of fine coal, such as existed at Buckeye, Dorr-Öliver engineers can be of help to you. For complete information, write Dorr-Oliver Incorporated, Stamford, Connecticut.

American, T.M. Reg. U. S. Pat. Off.



WORLD - WIDE RESEARCH . ENGINEERING . EQUIPMENT . STAMFORD . CONNECTICUT . U.S.A.

#### When you're working low coal ...



#21405

## don't let lazy loading trim your profits GOODMAN TYPE 965 LOADER

Here's a pace setting loading machine, only  $26\frac{1}{2}$ ° high, that will keep your operation in high gear. With a clean-up width of 7′ 1″ and the capacity to load at the rate of 10 tons per minute, it provides a "push" to the cutting machine ahead and keeps the shuttle cars moving out behind.

The 55 strokes per minute of the gathering arms

#21188



21415 16 accp pace with low vein loaders—Goodman cuttin machines and shuttle cars. A complete selection available

put coal onto the conveyor in a steady flow, and the 1750 rpm of the two 20 hp. head motors supply even power under all conditions of loading. The two head motors, as well as the two 20 hp. motors for tramming and hydraulic pumps are continuous rated. All motor parts are interchangeable.

Construction throughout is rugged, design is simple with a minimum of wearing parts. Accessibility is a feature, the use of unit parts facilitates replacement when necessary. A self-adjusting conveyor chain take-up maintains a constant length path of travel for the chain even with the rear conveyor swing a full 45° to the side of center.

All machine movements are hydraulically controlled with immediate smooth response to lever movements. It's easy to maneuver in close quarters.

For measures of coal upwards of 44" in height you will want to check the Goodman Type 966. It's a counterpart of the 965 except for an over-all height of 31½".

#### GOODMAN

MANUFACTURING COMPANY

Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES . CONVEYORS . LOADERS SHUTTLE CARS . LOCOMOTIVES . CONTINUOUS MINERS

Use Genuine Goodman Replacement Parts



Over-all view of mine. Each are car in foreground contains about 60 tons of are.



Tracks are constantly being moved as pit enlarges. Cables are moved with the tracks.



Cables lie in the sun or rain without any protection. They don't need any.



Shovel, being moved, carries 5000 feet of cuble with it in the steel box.



Workman manhandles the cable trailing a churn drill as it heads for new location.



Notice long span of this cable bridge and extreme flexibility of cable in foreground.



Shovels lift up to 18 tons in one bite; they operate 24 hours a day.





Entrance poles and meter houses. Cables start from here, work at 440 or 4000 valts.

# Iron ore mine finds Tiger Brand Amerclad in use since 1928

THE PICTURES show one of the greatest open pit iron ore mines in the world. From pole-head to meter house to shovels and drills, Tiger Brand Amerclad electrical cable serves as a flexible nerve system to supply the huge electrical requirements of machines that operate 24 hours a day in temperatures that range from 100° in the shade to minus 40° in the shoulder-deep snow.

Some of this cable has been in use since 1928, and it's still good.

Other cable is right in the blast area, where it is dragged over sharp rocks and pounded by dynamitepropelled boulders. Even this cable averages six to eight years of useful life.

Look at the pictures and read the captions that tell about operating conditions. You'll see why *no* heavyduty electrical cable has a greater reputation than Tiger Brand Amerclad. Call your American Steel & Wire representative for the whole story.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

#### USS TIGER BRAND ELECTRICAL WIRE & CABLE



A STANDARD TIGER BRAND CABLE FOR EVERY SPECIAL JOB

- asbestos wire and cable
- mold cured portable cord
- shovel & dredge cable
- · paper & lead cable
- varnished cambric cable
- interlocked armor cable
- special purpose wire & cable
- aerial, underground and submarine cable



UNITED STATES STEEL

# merican Coal Crushers are

Soundly engineered and constructed to give you many years of high volume crushing at low operating costs.

- 1. Oversize bearings.
- 2. Alloy Steel heat treated rotor shaft.
- Heavy rib reinforced housing with renewable liners and tramp metal pocket.
- 4. Manganese Steel crushing elements.
- Exclusive American-Originated rolling shredder ring which splits coal instead of crushing it.
- More efficient crushing design which permits slower operating speeds and less power consumption per ton of coal crushed.
- Dual adjustment to give flexibility of size control and to compensate for wear.
- Maximum flexibility of rolling ring rotor prevents injury from tramp iron.
- Full width screening area gives faster discharge of reduced product.

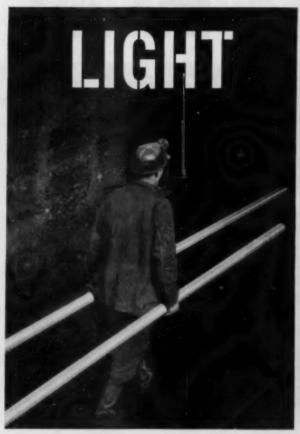
Coal Crushers exclusively, from Sample Crushers to Capacities of 800 TPH • Write for literature stating capacity you need.



Originators and Manufacturers of Ring Crushers and Pulverizors

1119 MACKLIND AVE. . SAINT LOUIS 10, MO.

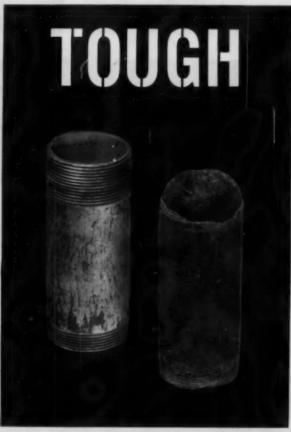
#### **Aluminum Mine Service Pipe**



One man carries two 20 ft. lengths of aluminum mine service pipe easily.

Two facts about Reynolds Aluminum pipe add up to lower cost in mine drainage service. In a recent test installation, Schedule 40 aluminum pipe was only slightly pitted after 60 days in a mine where the water contained more than 3.5% sulphur. Schedule 40 steel pipe in the same test became unusable. This obviously cuts long range cost.

Also, because of its corrosion resistance, Schedule 5 aluminum pipe can replace Schedule 40 steel at approximately the same cost



Aluminum pipe (left) stands up after 60 days in acid mine. Steel pipe, subjected to same test, is at right.

per foot, and with a savings in weight of 85%. For example, a 20 ft. section of 3" Schedule 5 aluminum pipe weighs only 21 lbs....compared to 152 lbs. for Schedule 40 steel. This, of course, means faster, easier handling and installation, and less labor.

Get details on this cost-cutting mine service pipe now. Write for "Reynolds Aluminum Mine Service Pipe" brochure. Reynolds Metals Company, P.O. Box 1800-NQ, Louisville 1, Kentucky.

See "CIRCUS BOY", Sundays, NBC-TV. Watch for Reynolds on "DISNEYLA

REYNOLDS ALUMINUM



# NOW... THE JOY





STRAIGHT TRAMMING . . . CLEAN BOTTOM

Smooth hydraulic tramming controlled by flow divider distributes power evenly to wide, self-cleaning treads for precise control of straight tramming and turning. Lower trim chain leaves smooth, wide bottom.



**EXCELLENT FACE PATTERN...GOOD ROOF** 

Notice how the boring arms and trim chains break coal from the face for good size consist. Arched sides and smooth trimming of roof gives good roof control.

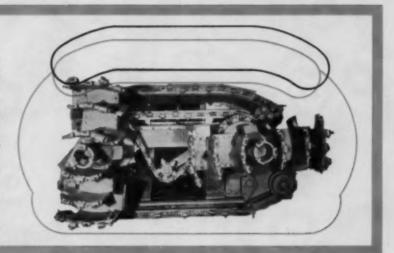
# TWIN BORING MINER

advances 2 feet per minute in a 7 foot seam . . . mines 8 tons per minute

#### EXTREMELY FLEXIBLE

There are two separate trim chains. The photograph shows the machine in the fully contracted position used for tramming. The orange line indicates the expanded position used for mining. The black line shows how the top trim chain may be raised or lowered 12 inches while mining for instantaneous control of cutting height to follow any seam.

Two sets of mechanically adjusted boring arms provide boring diameters of 72", 76", 80" and 84". Thus the one machine can be adjusted to meet several mining heights.



WSW CL 6727-107

Here's the Joy full-face continuous miner that does any job underground—development work, driving entries, headings, mining rooms and extracting pillars. This versatility is combined with a very high mining rate.

with a very high mining rate.

The rate of advance of a full face miner is largely dependent on the weight of the machine and the power driving it. The Joy Twin Borer weighs 40 tons and has a total of 260 horse-power. This weight and horsepower is supported on wide treads so that ground pressure is kept at a low 23 psi. Result . . . unequalled advance through the most difficult seams.

**EXTREMELY VERSATILE**—Boring pattern is easily changed from 6 ft. to 8 ft. high—from 12 ft. to

13 ft. wide or two other sizes in between. The top cutter chain can be moved 12" up or down while mining to follow undulating seams or changing seam thicknesses.

SIMPLE MAINTENANCE—All gear cases, transmissions and electrical controls are mounted on the outside of the machine frame. All clutches are the protective slip type.

the protective slip type.

THESE ADVANTAGES add up to high tons per man and low cost per ton, shift after shift. Talk to a Joy engineer about putting a Joy Twin Borer to work for you. Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt. Ontario.

WRITE FOR BULLETIN 187-1



#### EQUIPMENT FOR MINING...FOR ALL INDUSTRY

Anthracite Week September









CONTINUOUS MINERS, MOBILE LOADERS, SHUTTLE CARS, COAL CUTTERS, CUTTING MACHINE TRUCKS, COAL DRILLS, CONVEYORS, TIMBER SETTERS, SHUTTLE CAR ELEVATORS, BELT FEEDERS, FANS, BITS, PORTABLE BLOWERS, COMPRESSORS, ROCK DRILLS, HOISTS, CORE DRILLS



#### The how and why of Bethlehem Switch Heel Blocks

This shop-assembled sample clearly shows the how and the why of Bethlehem's new Switch Heel Block Design 992, which was developed especially for use with mine turnouts. When properly installed in the turnout, as shown, the 992 helps maintain heel spread and track gage at the heel end of the switch, keeping closure rail and switch point in correct alignment both vertically and horizontally.

Included with the sample are short lengths of rail, serving as stock rail (right), closure rail (upper left) and switch point (lower left). Assembly is a quick and simple matter and results are foolproof.

The block itself is the sturdy little weldment between rails. Two bushings welded to the left-hand side of the block slip through holes drilled in the switch point, thus permitting the bolts to be drawn up tight without hindering normal lateral movements of the points.

The Design 992 can be furnished to fit switches of any length and rail from 40 lb per yard and up. It can make an important contribution to the smooth, fast and efficient transportation your mine wants and needs for up-to-the-minute operations. A Bethlehem engineer, located in a nearby district office, will be glad to discuss the Design 992 Switch Heel Block in terms of your particular requirements.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation Expart Distributor: Bethlehem Steel Expart Corporatio

#### BETHLEHEM STEEL



# MACK Meavyfour- a

heavy-duty four- and six-wheel dumpers

15- to 34-ton capacity

#### \* LARGEST SELECTION OF HEAVY DUMPERS

Mack effers you the most complete fine of dumpers for mining, quarrying, road building, construction. From heavy-duty 170 horsepower, four-wheel dumpers with 15-ton capacities to super-duty 400-horsepower, sixwheel dumpers with 34-ton capacities, Mack provides the economy and performance that can mean bigger hauling profits for you.

#### \* CHOICE OF ENGINES

Mack offers you a choice of engines... Cummins diesels in the 300- and 400-horsepower class...or Mack Thermodyne and Cummins diesels in the 170 to 205 horsepower class. No need to alter existing maintenance facilities to handle new engine makes...you get the truck you want with the engine you want.

#### \* OUTSTANDING PERFORMANCE

When you buy Macks, you know that you are getting top performance, outstanding economy, maximum dependability—qualities that have made Mack the acknowledged heavy-duty truck leader in the industry. Moreover, Mack dumpers are planned for accessibility

throughout...engines are easily reached, no place in the suspension over needs adjustment—these and many more Mack features reduce maintenance costs and make routine servicing easier. And in Macks, you get the finest transmissions and axies available... made by Mack and found only in Macks!

#### \* COMPETITIVELY PRICED

Mack off-highway dumpers are priced right in line with competitive makes. Yet, with Macks, you get those "extras" that mean more payloads at lower hauling costs...cabs engineered for maximum driver efficiency...specially designed components with extensive use of heat-treated alloy steels...single-unit all-welded frames that can take plenty of hard knocks...outstanding performance and economy from a complete line of engines.

#### \* STOCK DELIVERY

All 15 and 22½-ton Mack dumpers are available from stock. The units you want with the engines and transmissions you want can be supplied upon gratifyingly short notice. There are no delays, no production schedules for you to worry about. For more information on delivery, contact your local Mack Dealer or Representative.



This four-wheel, off-highway dumper combines a big 15-ton rated capacity with outstanding maneuverability. Either a Mack or Cummins Diesel engine—along with heavy-duty clutch, 10-speed transmission, and Mack's Planidrive rear axle assembly—gives plenty of pulling power for long hauls on

steep grades. Rugged, unified frame assembly, powerful air brakes, and comfortable cab with driver's position offset to the left assure the top performance and efficiency that have made the LRX a highly popular dumper in mine, quarry, and road-building operations.

#### CONDENSED SPECIFICATIONS

#### STANDARD EQUIPMENT

DIMENSIO	INS:														Rear Tire
Wheel Base															13' 4"
Platform .										-		-	•	•	9.10
Overall Wid	th			•		•	*	*	5	*	*	*	*	•	9: 11:
Overall Heig	ht.						8-	*	*	*	*			,	10' 8"
Overall Heig	hs /1	Rods	. 0	ai		'n		٠		٠	٠	٠		*	18: 8"
Overall Len	of Sec.	ouu;		101	306	8,7		٠	*	*	٠	٠	7.	4	24/ 714/
Turning Circ	le D				-		ŧ		٠	ĸ	×	*	٠	*	74 135
(To outsid				tin	B)						į.		ļ.		60'
Weight		-													
(Chassis,	Bods	. 2	Ma	iel	15									9	2 000 lbs
Payload			*	*	*	•								a	10,000 105
ENGINE (D					4										10,000 103
ENGINE (D	iese	1):													10,000 103
ENGINE (D	iese	l):									EN	D	67	3	
ENGINE (D Model Make	iese	l):									EN Vla	D	67	3 Th	ermodyne
ENGINE (D Model Make Type	iese	i):								-	EN Vla	D ck	67	3 Th	ermodyne
ENGINE (D Model Make Type Number of c	vlinc	l):								-	EN Ma Nai	D ck	67 . 1	3 The ly	ermodyne aspirated
ENGINE (D Model Make Type Number of c Bore and str	liese	l):								1	Via Nation	D ck tur	67 . 1	3 The ly	ermodyne aspirated
ENGINE (D Model Make Type Number of c Bore and str Piston displa	vyline oke	l):								1	Via Nation	D ck tur	67 . 1	3 The ly	ermodyne aspirated
ENGINE (D Model Make Type Number of c Bore and str Piston displa Brake horse	yling	l): ders			in.					1 1 5 4 6	Na Na Six 17/2	Dek	67 . 1	3 The ly	ermodyne aspirated
Model Make Type Number of colore and strenge large lar	ylincoke oke ocem powe p.m.	fers			in.					1 1 5 4 6	Na Na Six 17/2	Dek	67 . 1	3 The ly	ermodyne aspirated
ENGINE (D Model Make Type Number of c Bore and str Piston displa Brake horse	ylincoke oke power	ders	, ci		in.					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	EN Ma Six 176	D ck tur	67 , 1 rai	13 The ly 6"	ermodyne aspirated

#### CLUTCH (Available with END 673 only):

Type . . . . . . . . . . Mack single-plate, dry Area of engagement, sq. in. . . 253

#### ELECTRICAL SYSTEM:

Voltage and capacity . 12 V., 50 Amp. (24 V., Starting)

#### TRANSMISSION:

Type . . . . . . . . Mack selective, constant mesh No. of speeds, forward . Ten reverse . Two

#### FRONT AXLE:

Make . Mack Reversed-Elliott, drop-forged 1-beam

#### REAR AXLE:

Make											Mack Planidrive
Drive											Dual Reduction
Final	Dri	ve	(3r)	d r	ed	uc	tic	m)			Planetary goar train
Total	Rat	io									within wheel hubs 16.5

#### BRAKES (Air):

	***	6.				
Compressor						Tu-Flo
Type						Internal expanding
						17¼" x 5" x ¼"
Rear, size			4			20" x 7" x ¾"
Hand, size						12" x 5" x 1/4", Bendix

#### FRAME:

Side-members, size . 12½" x 6½" x ½", wide flange 1-beam, rolled section Section modulus . . 60.7 (per rail)

#### SPRINGS:

Front, type				ı,	Semi-elliptic
Rear, suspension	8	8	,		Semi-rigid, axle mounted

#### WHEELS:

	•								
Type								Cast.	spoke

#### STEERING GEAR:

Control					0	0	0	0	0	0			Manual
			_								_		

#### TIRES: Front Rear Size . . . 12.00-24 (16P) Rib 14.00-24 (20P) Lug

#### CAB

Type: Heavy-duty off-highway, closed, all-steel welded. Offset 10%" to left of chassis centerline provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Front and rear tow pins; air horn on cab roof; cab entrance steps and platforms; rear view mirror, left side; channel type front bumper; dual windshield wipers; vertical exhaust; stop-tail light; rim lug wrench and handle.

#### HOIST:

Make & model . Heil Type-Twin, double-acting, 8" diameter, hydraulic cylinders with 24" stroke, 70" dumping angle.

#### BODY:

Type			۰		0					Rock, with scoop er	nd
Make .								0	6	Heil	
Capacity.	lie	ne.	of	p	at	8				9.8 cu. yds. struck	

Construction: %'' steel plate shell bottom; %'' sides and header; %'' wear and side bevel plates; %''' canopy, 3'' x 5 lb. channels between floor plates either side of a 1%'' edge-grain hardwood middle section filler.

#### **OPTIONAL EQUIPMENT**

#### ENGINE (Diesel):

Model								NHB	ENDT 673
Make		ï						Cummins	Mack, Thermodyne
Type .			٠	٠	٠			Naturally aspirated	Turbocharged
Numbe Bore as Piston of Brake 1	nd lis	st	ro ice	ke m	en	t cı	ú	51/4" x 6"	Six 4%" x 6" 672
2100								200	205
Max. to								1200 537	1400-1600 560

#### CLUTCH (Included with NHB and ENDT 673):

T	ype											0	0		Mack	two-plate,	dry
A	rea	of	en	ga	ge	m	eni	t,	sq.	H	١.	0	0	0	416		

#### TIRES: Front Rear

#### Size . . . 13.00-24 (18P) Rib 16.00-25 (20P) Lug

#### BODY:

Type		0	0				0	0	0	0		Flared Quarry Heil 11 cu. vds. struci
Make												Heil
Capac	ity	- 1	in	R O	f i	ola	to					11 cu. vds. struci

Construction: '%'' steel plate shell bottom; '%'' sides; '%'' header, slope: '%'' header, vertical; '%'' wear plate; '%' canopy. 3'' x 5 ib. channels between floor plates either side of a 1'm'' edge. grain hardwood middle section filler.

Body Equipment: (for std. and opt. bodies)—(9) ½ " x 6" alloy wear bars; rock ejectors; ½" alloy wear plate; horizontal bolsters (3 per side); canopy, loose for export shipment. (for std. body only): exhaust heating connections; welded-on side boards.

CHASSIS EQUIPMENT: Automatic radiator shutters; Wagner "BB" (24 hour chart 0.3500 r.p.m.) tachograph, in place of standard Tachometer; speedometer; hubodometer, left front wheel; Vickers power steering; front wheel limiting valve; hand control valve to operate rear service brakes; low air pressure indicator. Wig-Wag type; screen type radiator guard; 25,000 B.T.U. hot water cab heater with defrosters; spare rim; hydraulic jack, 20-ton; air starting; cold starting equipment; insulating dash mat.

MACK - FIRST



This four-wheel dumper with its 221/2-ton rated capacity provides maximum payloads at minimum unit cost. Equipped with either a 300 or 335-horsepower engine, over-gear transmission with two-speed compound or torque converter, and Mack's exclusive Planidrive rear axle assembly, it is powered to give top performance under the most punishing operating conditions. All-welded, single-unit, alloy-steel frame gives LVX's stamina and rugged durability. Elbow steering column, hydraulic steering booster, two-plate airassisted clutch, and job-engineered cab with extreme left driver position assure maximum operating efficiency. From top to bottom, this big Mack gives you the "extras" that mean minimum hauling costs.

#### CONDENSED SPECIFICATIONS

#### STANDARD EQUIPMENT

DIMENSIONS:						_	_	_		-	
Wheelbase					į.				į,		14' 2"
Platform											9' 11"
Overall Width Overall Height						ī.		2			11' 2"
Overall Height											11' 4%'"
Overall Length											26' 736"
Overall Length Overall Height (Body	Ė	hai	cad	6							21'
Turning Circle Diam.			200	.,		•					6.1
(To outside edge of	f	tin	0)								62"
Weight (chassis, bod											
Payload	3		1101	-				٠			45 000 lbe
			٠	٠	٠	۰		•			42,000 100.
ENGINE (Diesel):											
Model										N	HRBIS
Make											
Type											
Number of cylinders			٠	٠	٠	٠	٠	٠		S	iv
Bore and stroke		٠	٠	*	٠	٠	۰	٠	Y	61	14" + B"
Piston displacement	-		im	· in	ń		A.	٠		7/	78 A.U.
Brake horsepower (a											
Max. torque @ 1500	1.0	.р.	m.							81	IB ID,-IT.
CLUTCH:											
Type						M	ac	k '	Τu	m-	plate, dry
Area of engagement,											h-11.
Actuation									ıl,	W	ith air assist
ELECTRICAL SYST	E	м	*								
Voltage and capacity				l.,	50	0 /	Αп	ıp.	. (	24	V. Starting)

Type . . . . . . . . . . . . Mack No. of speeds, forward . Eight reverse . Two FRONT AXLE: Type . . . Mack Reversed-Elliott, drop-forged 1-beam

Mack selective, constant mesh

TRANSMISSION:

REAR AXLE: Make Mack Planidrive
Drive Dus Reduction, spiral bevel
Final drive (3rd reduction) Planetary gear train within
wheel hubs Total Ratio . . . . . . 17.66

BRAKES (Air): Tu-Flo Internal expanding 17¼" x 5" x ¾" 18" x 10" x ¾" Type Front, size Hand, size

FRAME: . I-beam, wide flange Type . . . Material Alloy steel 13" x 8" x %" (Fabricated) 74.8 per rail Side-members, size

Section modulus . . . SPRINGS:

Size . . .

STEERING GEAR:

Type Semi-elliptic Mack rubber shock insulators Rear Type

Progressive rate, semi-elliptic Cam face slipper ends with radius rods Suspension Frent TIRES: Rear 14.00-24 (16P) Rib 18.00-25 (24P) Lug

WHEELS: Type . . . . . . . . . . . . Cast. spoke

Power steering assist . . . Vickers hydraulic booster CAR: Type . Heavy-duty off-highway, closed, all-steel, welded. Cab offset 10% " to left of chassis centerline provides clear vision for driver to rear.

CHASSIS EQUIPMENT: Screen type radiator guard; front and rear tow pins; air horn on cab roof; dual wind-shield wipers; two air reservoirs; rear view mirror, left side; Mack power take-off and control (not available with Allison Transmission); door in hood side for access to oil filler and dip stick; exhaust through hood with inline muffler; channel type front bumper; stop-tail light; rim

lug wrench and handle. HOIST:

Type . . . Twin, double-acting, outboard mounted, three section telescopic cylinder assembly directly connected to body and chassis through a universal joint arrange-ment providing a 70° dumping angle. BODY:

Rock, with scoop end 

Construction: 1/4" steel plate shell bottom; 1/4" sides and header; ½" wear and side bevel plates; ¼" canopy.
3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle section filler.

#### **OPTIONAL EQUIPMENT**

ENGINE:
Model NRTO
Make & type Cummins, turbocharged
Number of cylinders Six
Bore and stroke 51/4" x 6"
Piston displacement, cu. in 743
Brake H.P. (a) 2100 r.p.m. (gov.) 335
Max.torque @ 1500 r.p.m 900 lbft.

TRANSMISSIONS: TRANSMISSIONS: Westinghouse Converter and Mack 4-Speed Transmission. Clutch—2-plate, 17", air actuated. Clutch—3 (Converter and Allison Transmission. Twin Disc Converter and Mack 4-Speed Transmission.

FRONT AXLE: Special Heavy-duty, Reversed-Elliott, Drop-Forged 1-beam.

Size . . . . . . . . . . . . . . . . 14.00-24 (20P) Rib BODY: Flared Quarry Make ... Heil Capacity, line of plate ... 15.2 cu. yds., struck

Construction: ¼" steel plate shell bottom; ½" sides; ½" header; ½" wear and side bevel plates; ½" canopy. 3" x 7.1 lb. channels between floor plates either sade of a 2" edge-grain hardwood middle section filter.

Body Equipment: (for std. and opt. bodies): (9) %" x 6" alloy wear bars; rock ejectors; horizontal bolsters (3 per side); canopy toe board; rock guards over tires; canopy, loose for export shipment. (for std. body); welded-on side boards; exhaust heating connections.

CHASSIS EQUIPMENT: Air starting, Ingersoll-Rand 9HP; Tachograph, Wagner "BB" (24 hour chart 0-3500 r.p.m.) in place of standard Tachometer; Wig-Wag low air pressure indicator; hand control valve to operate rear service brakes; front wheel brake limiting valve; 25,000 B.T.U. hot water cab heater with defrosters; windshield fan mounted on windshield header; hubodometer; engine chrome cylinder liners and stellite inlet valve seats; insulating dash mat; fender to bumper treads: air operated radiotr shutter; air operated Thermotreads; air operated radiator shutter; air operated Thermo-controlled radiator fan hub; speedometer; back-up light; hydraulic jack, 30-ton; spare rims.



Powered by either a 300 or 335-horsepower engine, this 30-ton, six-wheel dumper has what it takes for off-highway operation in mines, quarries and earthmoving projects. Smooth application of power to its balanced, four-wheel drive bogie is obtained by an air-assisted clutch and overgear transmission with two-speed compound or torque converter.

Convenient location of controls, angle steering column, hydraulic steering booster, and extreme left driver position give easy and efficient handling. Best materials, precision manufacture, and specially engineered components make the LRSW capable of withstanding the toughest 'round-theclock hauling.

Wheels, type Tires, size

Ply-rating, front

#### CONDENSED SPECIFICATIONS

Type and actuation . . Internal expanding, inclosed, air

#### STANDARD EQUIPMENT

Commente Edon went
DIMENSIONS:
Wheelbase
Platform 14' 1114"
Overall Width
Overall Height 11' 61/6"
Overall Length         29' 2%"           Overall Height (Body Raised)         24' 10"
Overall Height (Body Raised) 24' 10"
Turning Circle Diam.
(To outside edge of tire) 78'
Weight (chassis, body & hoist) 60,000 lbs.
Payload
PARTIE (B)
ENGINE (Diesel):
Model NHRBIS
Make Cummins
Type Supercharged
Number of cylinders 6
Bore and stroke 51/6" x 6" Piston displacement, cu. in. 743
Piston displacement, cu. in
Brake horsepower(d) Z100 r.p.m. (gov.) . 300
Max. torque @ 1500 r.p.m 818 lbft.
CLUTCH: Type
ELECTRICAL SYSTEM:
Voltage and capacity 12 V., 50 Amp. with 24 V., starting
TRANSMISSION:
Type
FRONT AXLE:
Type Mack Reversed-Elliott, drop-forged I-beam
BOGIE: Make Mack Planidrive
Final drive, type Four-wheel, planetary
Final drive, type Four-wheel, planetary Inter-axle differential, type . Mack concentric cam and
plunger Power Divider
Carriers Mack Dual Reduction Total Ratio

Rear, size
FRAME:
Type I-beam, wide flange Material Alloy steel Side-members, size 13 15 2" x 8" with %" web and top flange, %" bottom flange
Section modulus 84.5 per rail
SPRINGS:
Type, front Semi-elliptic rear Semi-elliptic, inverted Rubber Shock Insulators
SHOCK ABSORBERS, FRONT:
Type Houdaille, hydraulic
TIRES (Lug): Front Rear
Size 14.00-24 (20P) 16.00-25 (20P)
WHEELS Cast, spoke
STEERING GEAR:
Power steering assist Vickers hydraulic booster
CAB:
Type Heavy-duty off-highway, closed, all-steel, welded. Offset 10% "to left of chassis center-line provides clear vision for driver to rear.
CHASSIS FOUIDMENT: Wichodomologicono biogradi

CHASSIS EQUIPMENT: Hubodometer: screen type radi-CHASSIS EQUIPMENT: Hubodometer; screen type radiator guard; front and rear tow pins; air horn; rear view mirror, left side; exhaust through hood with in-line muffler; channel type front bumper; door in hood side for access to oil filler and dip stick; insulating dash mat: wig-wag low air pressure indicator; windshield wipers stop and tail light; back up light; rim lug wrench and handle; automatic radiator shutters.

HOIST:

Make Type—Twin, double-acting 10" diameter, hydraulic cylinders with 40" stroke, 70 dumping angle with power

BODY:

Heil, Rock-scoop end Make and type Capacity, line of plate 21 cu. yds.

Construction: '4" steel plate shell bottom; '4" sides and header; '4" stope section; '4" alloy wear and side bevei plates; '4" canopy. 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood middle

OPTIONAL	EQUIPMENT
ENGINE:	
Make and model	Cummins, NRTO
Number of cylinders	Six
Bore and stroke	51/4" x 6"
Piston Displacement cu. in.	743
Brake horsepower (a)	
2100 r.p.m. (gov.)	335
Max. torque@	
1500 r.p.m.	900 lbft.
Turbocharger	900 lbft. Turbine, exhaust driven
Clutch-2-plate, 17", air	Mack 4-Speed Transmission. actuated, er and Allison Transmission.
WHEELS, TIRES: Front & rear	

BODY EQUIPMENT: (9) %"x6" alloy wear bars; 1" alloy wear plate; rock ejectors; horizontal bolsters (4 per side); twin body prop; rock guards over tires; exhaust heating connections; canopy, loose (for export shipment).

Cast spoke 16.00-25

20 or 24

heating connections; canopy, loose (for export snipment);
CHASSIS EQUIPMENT: Air starting, Ingersoll-Rand
9HP; chrome cylinder liners and stellite inlet valve seats;
air operated Thermo-controlled radiator fan hub; Tachograph, Wagner model "BB" (24 hour chart 0-3500 RPM)
in place of standard Tachometer; speedometer; front
wheel brake limiting valve; alcohol vaporizer; cab insulated; exhaust outlet under cab suitable for attachment
to body for body heating; 25,000 B.T.U. hot water cab
heater with defrosters; solex glass for windshield; windshield fan mounted on windshield header; fender to
bumper steel treads; two stop-tail lights; 20-ton hydraulic bumper steel treads; two stop-tail lights; 20-ton hydraulic



The 34-ton rated capacity of this super-payload, sixwheel dumper assures minimum haulage costs for the big earth-moving jobs. Equipped with a 400horsepower engine, four-speed overgear transmission, hydraulic torque converter or two-speed compound, and a balanced, four-wheel drive bogie, LRVSW's can negotiate severe grades fully loaded. Maneuverability and ease of handling are facilitated by such features as a hydraulic steering booster and airassisted clutch. Heat-treated, stress-proportioned, single-unit frame gives the structural stamina needed to withstand severest operating conditions. All these features, and many more, contribute to unmatched durability and minimum haulage costs.

#### CONDENSED SPECIFICATIONS

FRONT AXLE:

#### STANDARD EQUIPMENT

DIMENSIONS:													
Wheelbase													16' 10"
Platform													14: 1136"
Overall Width Overall Height Overall Length							*	-			Č	Ċ	11' 234"
Overall Height						-	*		*		-		11' 756"
Overall Length								*	*			-	31' 31/4"
Overall Height (	Rods	, R	iei	200	ď		*	*	*		*	*	25' 2"
Turning Circle D	iam	oho	F	30	4,		*		*	*	*	*	20 5
(To outside e				ia									78'
Weight (chassis,	hod	w	2	ho	iel	â	*				*	-	68 000 lbs
Payload													
rayioau		0	0								٠		00,000 103.
ENGINE (Diese	·/\												
Model										803/	na.	12	00
Make	0 0	0	0	0		0			. !	UU N	mı	mu	ns
Type		0	0		0					INE	tu	rai	iy aspirated
Number of cylin	ders		0			0				12			0.47
Bore and stroke					0	0	4		. !	51/1	"	X	6"
Piston displacen	nent	, CI	u.	in						148	36		
Brake horsepow	er (a	1											
2100 r.p.m. (j	(.voj								. 1	<b>500</b>	)		
Max. torque(a)	1200	1.	p.	m.					. 1	1,0	75	Ib	ft.
Fuel tank and lo	catio	m								150	) g	al.	, back of cab
											-		
CLUTCH:													
Make									. 1	Lie	e	Ro	llway
Tune		۰								Tw	m-	nli	te dry
Type	toon			in	0	0				571	-	Print	ito, dry
Area or engagen	rent,	31	4-	111	0.	0	0			96 I			
Actuation		0			0	0	4		. 1	nii			
				6-									
ELECTRICAL :	212	E	M										

Rating, horsepower Cold starting aid . . . . . Ether injection TRANSMISSION: Mack selective constant mesh Type . No. of speeds, forward . Four reverse . One

12 V., 75 Amp. Leece-Neville, alternator

Bendix-Westinghouse

STARTING SYSTEM: Starting motor, type . .

TORQUE CONVERTER: Westinghouse 18" Single stage, hydraulic

type		W	lac	K	Ke	versed-Elliott, drop-torged 1-beam
Final drive,	ty	Di	ė .			Mack Planidrive     Four wheel, planetary     Mack concentric cam and plunger type Power Divider
Carriers . Total ratio	p .e.	0	0	0	0	Mack Dual Reduction
Front, size Rear, size					*	Internal expanding, inclosed, air 17½" x 5" x ½" 20" x 7" x ½" 12" x 5" x ½"
FRAME: Type Material						I-beam, wide flange Alloy steel

Side-members, size Depth 141/4", flange width 8", flange thickness 1" Section modulus . . . 130.0 per side SPRINGS:

Type . . . . . . . . . Semi-elliptic
Suspension, Mack . . . Rubber Shock Insulators SHOCK ABSORBERS, FRONT: Type . . . . . . . . . . . . Houdaille, hydraulic

TIRES (Lug) Front and Rear: . . . . . . . . . . . . 16.00-25 (20P) Siza

WHEELS: Type . . . . . . . . . . . . . . . Cast, spoke STEERING GEAR:

Type . . Heavy-duty off-highway, closed, all-steel, welded, Offset 10%" to left of chassis centerline provides clear vision for driver to rear. CHASSIS EQUIPMENT: Screen type radiator guard;

hubodometer, front and rear tow pins; air horn; rear view mirror, left side; dual exhaust through hood with inline mufflers; channel type front bumper; rim lug wrench and handle; door in hood side for access to oil filler and dip stick; insulating dash mat; windshield wipers; stop and tail light; back up light; automatic radiator shutters.

Make & Type

Heil, twin, double-acting, outboard mounted, four-section telescopic cylinder assembly directly connected to body and chassis through a universal joint arrangement to provide maximum flexibility.

Dumping angle

70°

Make & Type . . . . . . . . Heil Rock, scoop end Capacity, line of plate . . . . . 24 cu. yds. struck

Construction: 1/4" steel plate shell bottom: 3/4" sides and header; ¾" alloy wear and side bevel plates; ½" front slope plate; ¼" canopy. 3" x 7.1 lb. channels between floor plates either side of a 2" edge-grain hardwood

#### **OPTIONAL EQUIPMENT**

TRANSMISSION (In place of 4-Speed and Westinghouse Converter):

Make & Type . . . . . . M Speeds Forward . . . . . 8 Speeds Reverse . . . . . 2 Make & Type Mack Two-Lever, Duplex

TIRES (Lug) Front and Rear: Size . . . . . . . . . . . . . . . . . 16.00-25 (24P)

BODY EQUIPMENT: (9) %" x 6" wear bars over standard %" alloy wear plate; 1" alloy wear plate; place of %" alloy wear plate; exhaust heating; rock ejectors; rock guards over tires; twin body prop; horizontal bolsters (5 per side).

CHASSIS EQUIPMENT: Air operated Thermo-controlled radiator? In hub; Tachograph, Wagner model "BB" (24 hour ch-10-3500RPM) in place of standard Tachometer; speedometer; front wheel brake limiting valve; alcohol vaporizer; 25,000 B.T.U. hot water cab heater with defrosters; solex glass for windshield; with shield fan mounted on windshield header; fender to bumper steel treads; cab insulated; two stop-tail lights; many rights. spare rim; 20-ton hydraulic jack.

#### only MACK gives you features like these...

#### MACK-BUILT FRONT AXLES

Mack's reversed Elliott, drop-forged I-beam front axles are made extra strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. Straight tie rod and rugged construction of airactuated brake shoes insure top performance.

#### MACK-BUILT 2-WHEEL REAR AXLES

Mack's two-wheel, rear axle assemblies have an unmatched reputation for durability under strenuous service. The strongest, most wear-resistant materials are used through-out. Dual Reduction, gear-type differential and Mack's famous planetary gear reduction at the wheel hubs (Planidrive) provide the smooth distribution of power needed for top truck performance. Planetary gears can be serviced or repaired without removing tires or disturbing wheel bearing adjustment.

#### MACK-BUILT TRANSMISSIONS

Dependable performance and long life are standard in Mack transmissions. Shown here is the heavy-duty overgear transmission used for the LRVSW, LRSW, and LVX offhighway dumpers. The four-speed main transmission and twospeed compound are assembled as a unit to give eight forward and two reverse speeds. The four-speed main transmission without the two-speed compound is offered in combination with torque converter. All gears use Mack tetrapoid or quadrapoid tooth design and are drop-forged and case-hardened . . . gears noted for lasting the life of the truck.

#### MACK-BUILT 4-WHEEL BALANCED BOGIES WITH EXCLUSIVE POWER DIVIDER

Under the worst conditions of mud, loose gravel, or difficult terrain, you get maximum pulling power with Mack's four-wheel drive Balanced Bogies because exclusive Mack Power Dividers apply power to the wheels with traction. Planidrive final reduction gears in all four hubs provide needed reduction without excessively large carriers, differentials, or axle shafts. Maintenance is reduced to a minimum.

#### MACK first name for TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey

In Can da: Mack Trucks of Canada, Ltd. The finest, fastest, most efficient coal dryers

are still made by C.M. C.M.

C·M·I c·M·I C·M·I C·M·I

CONTINUOUS CENTRIFUGAL COAL DRYERS

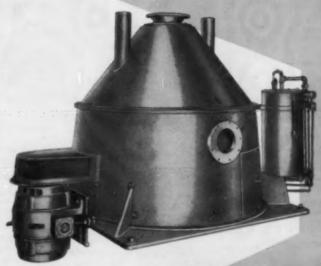
#### A FINE DRYER...PLUS SERVICE

The C.M.I. Dryer will do a magnificent job, reducing 35% moisture content in coal to less than 5%.

A whale for work; amazing drying capacity. Our engineers are available to render prompt service whenever and wherever needed.

#### A FINE DRYER...PLUS SERVICE

The C.M.I. Dryer
will also prove its worth
as a real profit-producer
by recovering marketable coal
from your slurry ponds.
Our engineers are available
to render prompt service
whenever and wherever needed.









This is a 100% Home (U.S.A.) Industry.

All replacement parts are always available on short notice.

When in St. Louis, visit our factory.

CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.

146 PRESIDENT STREET . SAINT LOUIS 18, MISSOURI

#### **MOST MINES USE**





#### Tailor-made to do the BEST Bolting Job in ANY Mine!











#### HERE ARE SOME OF THE OPERATIONS WHERE FLETCHER MACHINES PROVIDE HIGH-CAPACITY LOW-COST ROOF CONTROL

ALABAMA POWER CO., Birmingham, Ala.

ALLEGHENY RIVER MINING CO., Kittanning, Pa

AMHERST COAL CO., Glenelum, W. Va.

ARMCO STEEL CORP., Montcoal, W. Va.

BAKER COAL CO., Clintwood, Va.

BESTWALL GYPSUM CO., Akron, N. Y.

CHARLES E. CAMPBELL, Bridgeville, Pa.

CANNELTON COAL & Cannelton, W. Va.

CRUCIBLE STEEL CO.
OF AMERICA, Crucible, Pa.

CHICAGO, WILMINGTON & FRANKLIN COAL CO., West Frankfort, III.

CLEAN COAL CO., Bellaire, Ohio CLINCHFIELD COAL CO., McClure, Va

CLINCHFIELD COAL CO., Monterey, Tenn.

COAL PROCESSING CORPORATION, Norton, Va.

COLUMBIA-SOUTHERN CHEMICAL CORP., "Midvale, Ohio

CONEMAUGH MINING CO., Seward, Pa.

CROZER COAL & LAND CO., Lynco, W. Va.

CRYSTAL BLOCK COAL & COKE CO., Rawl, W. Va.

DAWSON DAYLIGHT COAL CO., Dawson Springs, Ky.

DUQUESNE LIGHT CO.

EASTERN GAS & FUEL ASSOCIATES, Pittsburgh, Pa.

EMERALD COAL & COKE CO., Clarksville, Pa.

ENOCO COLLIERIES, INC. Vincennes, Ind.

FEDS CREEK COAL CO. INC., Harman, Va.

FREEMAN COAL MINING CORP., Chicago, III.

GRAND RAPIDS PLASTER CO., Grand Rapids, Mich.

GREENSBURG-CONNELLSVILLE
COAL & COKE CO.,
McKeesport, Pa.

HARMAN MINING CORP., Harman, Va

INLAND STEEL CO., Wheelwright, Ky.

INTERMOUNTAIN CHEMICAL CO., Green River, Wyo.

INTERNATIONAL MINERALS & CHEMICAL CO., Carlsbad, N. M.

ISLAND CREEK COAL CO., Holden, W. Va.

JOHNSTOWN COAL & COKE CO. Johnstown, Pa.

KENTUCKY RIDGE COAL CO., Field, Ky.

LAKE SUPERIOR COAL CO., Superior, W. Va.

THE LORADO COAL MINING CO., Lorado, W. Va.

LUMAGHI COAL CO., Collinsville, III.

McCANDLISH COAL CO., Meadowbrook, W. Va.

NASSAU COAL CO., Pageton, W. Va.

NATIONAL GYPSUM CO., Clarence Center, N. Y. NATIONAL MINES CORP., Weirton, W. Va.

THE NEW RIVER CO., Mount Hope, W. Va.

NEW RIVER & POCAHONTAS CONSOLIDATED COAL CO., Capels, W. Va.

OLD BEN CORP., Benton, III.

OMAR MINING CO., Omar, W. Va.

PANDORA COAL CORP., Sullivan, Ind.

PECKS RUN COAL CO., Buckhannon, W. Va.

PEERLESS COAL & COKE CO., Bluefield, W. Va. PITTSBURGH-CONSOLIDATION COAL CO., Library, Pa.

POCAHONTAS FUEL CO., INC., Pocahontas, Va.

THE POWELLTON COAL CO., Mallory, W. Va.

POWHATAN MINING CO., Powhatan Point, Ohio

RALEIGH WYOMING MINING CO., Edwight, W. Va.

REEVES COAL CO., Clarksburg, W. Va.

RIVERTON COAL CO., Crown Hill, W. Va.

RUSSELL FORK COAL CO., Elkhorn City, Ky.

SAHARA COAL CO. INC., Harrisburg, III.

SIMPSON COAL & CHEMICAL CORP., Dawmont, W. Va.

SLAB FORK COAL CO., Slab Fork, W. Va.

STONEGA COKÉ & COAL CO., Big Stone Gap, Va.

SYCAMORE COAL CO., Cinderella, W. Va.

TRUAX-TRAER COAL CO., Chicago, III.

UNITED POCAHONTAS COAL CO., Crumpler, W. Va.

U. S. GYPSUM CO., Oakfield, N. Y.

U. S. STEEL CORP., Pittsburgh, Pa.

THE VALLEY CAMP COAL CO., Moundsville, W. Va.

VIKING COAL CORP., Terre Haute, Ind.

THE WARNER COLLIERIES CO., East Springfield, Ohio

WEST KENTUCKY COAL CO., Madisonville, Ky.

WESTMORELAND COAL CO., Madison, W. Va.

WHITE PINE COPPER CO., White Pine, Mich.

WIND ROCK COAL & COKE CO., (Division of Bessemer Coal, Iron & Land Co.) Oliver Spring, Tenn.

THE Y. & O. COAL CO., Cadiz, Ohio

J. H. FLETCHER & CO.

O. Box 353, HUNTINGTON 8, WEST VIRGINIA Phone 44186



ime is



with the

#### Lee-Morse BUS & JITNEY

Take a real good look at these
LEE-NORSE "TIME-SAVERS"! Like modern
misers they hoard minutes into extra productive
hours by cutting portal to portal time—reducing
costs—increasing tonnage output.



#### Lee-Morse MINE PORTAL BUS

(Locomotive Type)

This self-propelled Portal Bus for hauling section production crews to and from the face is unique with its split roof construction giving the driver an unimpeded, all directional view... the trolley is always within easy reach of the operator. Our standard low and high type Portal Bus operates in the majority of coal mines and will haul from 13 to 20 Men. This Portal Bus is powered with one (1) large motor (15 H. P.) and has two (2) independent braking systems for complete safety — (airplane-type) disc brakes hydraulically operated on each axle and dual mechanical hand operated service brakes on each wheel.

TIME IS MONEY — SAVE IT with the Lee-Norse Mine Portal Bus!



#### Lee-Norse JITNEY

Wherever they're in use—they're regarded as a time saving asset. Fleet and versatile the Jitney furnishes quick, sure transportation to and from the working face for key personnel, inspectors, engineers, etc. When required the Jitney can be pressed into service as an ambulance and is suitable for pulling fire fighting equipment.

TIME IS MONEY — SAVE IT with the Lee-Norse Jitney.

Write NOW for Literature

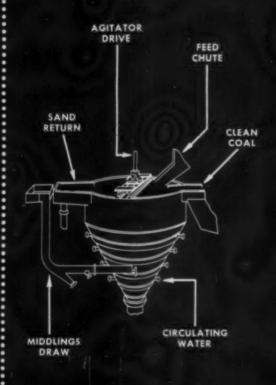
Lee-Norse Company

DESIGNERS AND BUILDERS OF THE FAMOUS LEE-NORSE MINER

FAIRMON

100

# CHANCE



Processing more than 50,000 tons of coal per hour throughout the industry.

- The Chance Cone is now made only by Fairmont Machinery in the United States. Fairmont manufactures, sells and services (both new and old) this coal cleaning apparatus. The Chance System successfully processes coal of widely varying characteristics at operating specific gravities ranging from 1.35 to 1.65 with sizes from 1/8" to 10".
- Thoroughly dependable, Chance Cones require only normal maintenance and will recover close to 100% of marketable coal at minimum cost per ton. The operation is handled by only the part-time attention of one man.

FAIRMONT MACHINERY COMPANY FAIRMONT, WEST VIRGINIA

Designers and Constructors of Complete Coal Preparation Plants Using Both Wet and Dry Cleaning, Centrifugal and Thermal Drying.



#### 2 rubber-tired tractors

handle all clean-up around 3 shovels, and service 12 stockpiles in wide pit area

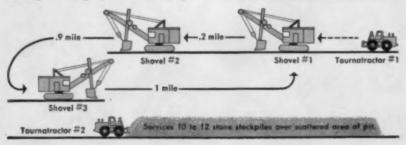
At Material Service Corporation's Thornton, Illinois quarry—the largest commercial quarry in the world—over 3,000,000 tons of limestone are removed yearly. To speed shovel cleanup, dozing, and other jobs at this huge 6000' x 4000' pit, Material Service Corp. uses 2 fast, 17 mph, rubber-tired, 208 hp Tournatractors.

#### Make 2-mile swing cycle

A major advantage of the rubber-tired Tournatractor on this assignment is its ability to travel fast at speeds to 17 mph, from shovel to shovel . . . scattered .2, .9 and 1 mile apart . . . making a swing cycle for clean-up service of over 2 miles. Instant-shift, constant-mesh transmission enables this big rubber-tired dozer to move in fast and back away in a hurry, without delaying the shovel cycle. Between shovel swings, the versatile tractor dozes in scattered rock to keep material in good shovel-loading position... also pushes back toe of blasted material from bank ahead.

#### Tires eliminate abrasive wear on multiple track parts

Big, low-pressure rubber tires with heavy ground-gripping action make Tournatractor safe and sure-footed. Tires roll over abrasive materials . . .



Handy Tournatractor services 3 shovels over widely scattered work area in 6000' x 4000' limestone pit. It pushes in shallow toe ahead of shovel for faster loading. It's fast enough to follow the dipper in and out to clean-up truck and dipper spillage.

do not grind in them. They cushion the ride for the operator, and reduce maintenance to a minimum, because 4 wheels do the work of some 500 wearing parts in a crawler-tractor's track mechanism.

Power from the Tournatractor's 208 hp diesel moves on high-speed, anti-friction bearings sealed in oil. With this all-gear drive you have no chains or tracks to stretch, snag, or wear. Power goes direct from transmission to drive wheels. As a result, there are less friction losses and wear due to hundreds of open parts grinding in dirt or abrasives.

Before you buy a tractor for your clean-up, dozing, servicing, maintenance, or other jobs, investigate the high speeds, lower maintenance, and greater mobility that Tournatractor can give you. It frequently replaces 2 or 3 crawlers in one pit!



Fast 17 mph speeds enable Tournatractor to travel anywhere in the pit, dumps, stockpile area, or plant, with only a few minutes moving delay between assignments. One man, one machine, can make two or three cycles, to cover all clean-up assignments per shift. Often, several near-by pits are serviced by one of Material Service's Tournatractors.



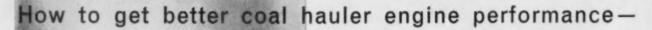
Tournatractor maintains and services 10 to 12 crushed stone stockpiles located over a widely scattered area of the quarry. Equipped with 11' 4" wide, 3' 7" high bulldozer blade, Tournatractor dozes bladeful of abrasives.

Tournatractor—Trademark Rea, U.S. Pat. 0T. (63)-QM-6



#### LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



## use STANDARD **DIESEL FUELS**

STANDARD Diesel Fuels - now with STA-CLEAN\* - deliver the big benefits that help you get (1) the power your coal hauler engines are rated to deliver, (2) the performance economy you must have, (3) the low maintenance costs that mean profitable operations.

STA-CLEAN is a STANDARD Diesel Fuel exclusive. This additive prevents fuel-injector sticking, insures clean burning of the fuel, prevents rusting of tanks, fuel lines, and injector parts.

Clean fuel. Standard exercises special care in handling diesel fuel to make sure it's delivered to you as clean as it was when it left the refinery. Contamination is eliminated. There's no foreign matter in the fuel to cause engine failure or maintenance problems.

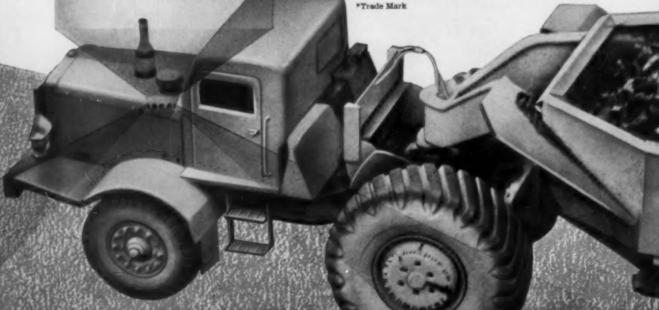
Balanced distillation of STANDARD Diesel Fuels means good, as well as economical, performance; and with cleaner engine operation, you may be able to extend overhaul periods for your coal haulers.

Low pour point. STANDARD Diesel Fuels delivered to operators in cold climates have a pour point of  $-20^{\circ}$  F. or lower . . . plenty of margin here to insure uninterrupted operation at low temperatures.

Get the facts about STANDARD Diesel Fuels from your Standard Oil industrial lubrication specialist. There's one of these specialists near you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY STANDARD (Indiana)







After 29 years of continuous digging in the same pit area, pit still produces 3600 tons of "pay dirt" per 12-hr. day. The last nine years, pit has been operated by Valley Sand and Gravel Co., Waukesha County, Wis. Valley's hillside excavation runs about 80' deep. Company officials estimate it will be excavated at least another 30' before digging operation is relocated to a new pit area.

Two LeTourneau-Westinghouse Rear-Dumps — one 22-ton model "C", and one 11-ton "D" — are setting a fast production pace by handling all hauls from pit to grizzly. Company uses another L-W Rear-Dump for hauling processed materials to stockpiles.

#### Haul heaping loads up 10% grade

In typical performance, C Tournapull® Rear-Dumps are loaded with 5 passes of 2½-yd. shovel — getting about 12½ bank yds. (19 tons). Three passes load the "D" with 7½ yds. (12 tons). Rear-Dumps haul 1100' from pit floor... up a 10% grade... to grizzly. Except for delays at grizzly, each machine makes

9-10 trips per hour. Combined production of the 2 units averages 200 yds. (300 tons) per hour...3600 tons per day.

#### "A good machine . . . gives no trouble," says operator

Until 1952, Valley Sand and Gravel Co. used ordinary trucks for their rough pit haul work. Each year they experienced heavy maintenance expenditures, amounting to thousands of dollars. In 1952... in an effort to step-up pit production and cut maintenance expense... they purchased 2 L-W Rear-Dumps. These rugged off-road haulers proved so successful, they now operate 3 of them.

Superintendent Carl Darrow says, "Tournapull Rear-Dumps outlast ordinary haul trucks 10 to 1. Most truck bodies are too thin. Our work is also too hard on truck tires, transmissions, differentials, axles, springs and drive shafts."

Jim Schmeichen, operator of C Rear-Dump, comments, "It's a good machine...does the work, and gives us no trouble. You don't have to worry about breaking a spring." Shovel operator quickly loads C Tournapull Rear-Dump with 19 tens of bank gravel. Low rear entry of bowl permits easy swing-out of empty dipper — even without closing door.

L-W hauler dumps load of gravel and rock into grizzly. With electric heist, bowl can be lifted for full, instant dump, or controlled at a reduced angle for slaw, precision feeding.



#### Get facts for your type work

Check all the facts and figures available from other Tournapull hauler owners, for work like yours. See how these Rear-Dumps can give you more production at far less cost. L-W Tournapull Rear-Dumps are available in three sizes: 11, 22, 35 tons.



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



# USE RIP and FIRE-RESISTANT RAY-MAN CONVEYOR BELT... "More Use per Dollar"

Special cushioned and rip-resisting strength members with double compensation to relieve stress on outer plies, give Ray-Man Conveyor Belt unusual flexibility. Ray-Man trains naturally, troughs easily... permits fuller loads of coal even where relatively thick, narrow belts are used... or where pulleys are small in low head-room installations. No breaker ply is required for Ray-Man, because it's specially constructed to resist gouging and tearing, and hold fasteners—under the most severe conditions. Like all Manhattan heavy duty conveyor belts, Ray-Man is moisture, mildew-proof... protected against wear, tear, cuts and abrasion by R/M's exclusive "XDC" Cover. And, like all R/M underground belts for coal mining, it's now available in special fire resistant construction with Bureau of Mines' acceptance designation: "Fire Resistant, U.S.B.M. No. 28-10." Fire Resistant Ray-Man Conveyor Belt cuts handling costs because it does a better, safer job... and lasts longer!

Let an R/M representative show you advantages in other R/M feature conveyor belts, too...extra-cushioned Homocord, for abusive shock loading...R/M Tension-Master for extra long slope lifts and high tensions. There's an R/M heavy duty conveyor belt to give you "More Use per Dollar" on every job! Write for descriptive bulletins.

More Dependable Mine Drives

with R/M Poly-V°



This patented new concept in heavy duty drive transmission delivers up to 50% more power in the same space as ordinary V-belts...equal power in less space! It employs a single, V-ribbed belt...eliminates "matching" problems...cuts belt and sheave inventories to a new low! Write for a copy of Poly-V\* Drive Bulletin #6638 today!

\*Poly-V is a registered Raybeston-Manhattan

RM-711

BELTS . HOSE . ROLL COVERINGS . TANK LININGS . INDUSTRIAL RUBBER SPECIALTIES



#### RAYBESTOS - MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

# WHICH COSTS YOU MORE...



**Buying Bits or** 



**Changing Bits?** 

When non-productive man-hours are considered, changing bits can be more expensive than the cost of the bits alone. Idle loaders, timbermen or roof bolters, plus the time of the men changing bits all add a considerable amount to your cost per ton.

Kennametal\* bits help you cut bit changing costs two ways. First, by staying sharp longer, Kennametal Bits mine more coal between changes, at a faster rate, with less power. In addition, with minimum "spotting," the consistently long life of Kennametal Bits enables you to schedule bit changes for normal maintenance periods.

Your Kennametal Representative can show you many other cost-cutting features throughout the complete range of Kennametal Bits for all cutting and drilling operations. Ask him about a test demonstration in your mine. See for yourself how Kennametal Bits can save you money. Kennametal Inc., Mining Tool Division, Bedford, Pennsylvania.

\*Trademark



KENNAMETAL
... Partners in Progress













#### Power shovel breaks down . . .

#### So quarry moves boulders with

All over the country, more and more dirtmovers are finding Michigan Tractor Shovels can effectively handle jobs once considered much too tough for rubber-tired equipment.

You've probably read about—or seen—Michigans digging pit-run gravel. Or breaking out reinforced concrete. Or clearing brush. Now here's another dramatic application.

#### Maintains pit production

The company involved, a large northeastern firm, had always had trouble maintaining pit production when any of their big power shovels broke down. One time this happened, they had a Michigan Tractor Shovel in the pit on demonstration. They decided to put it through the rugged test of rock loading.

#### Now own six Michigans

That was in 1954. Today, this company owns six Michigan Tractor Shovels! In emergencies these units

effectively handle both rock loading and cleanup. They also handle *all* truck-loading of screened aggregates and other products of the multi-million-ton crushed stone plant. Management estimates their output "definitely greater" than output of loaders formerly used. Maintenance costs, over periods ranging up to three years, have been "satisfactorily low".

#### Boulders weigh up to 7 tons each

Note the photos. Above, one of the company's five 2¾ yard Michigan Model 175A's is moving huge boulders to stockpile for later sale as rip-rap. Each chunk weighs ½ to 7 tons . . . yet at no time has operator reported trouble handling them. Upper right, another Model 175A loads shot rock at the quarry face. Michigans' unobstructed dumping height, power shift, and power steer helps speed both emergency assignments.

#### Load 10 tons in 2 to 3 minutes

Stockpile loading (lower right) keeps the company's





This is the type of shot rock that must be loaded into trucks for transport to crushers. Michigan Tractor Shovels must be able to take a lot of punishment—and they do!



A full bucket every time saves trips, cuts handling costs of loading crushed stone or sand. This load weighed out at 7,000 lbs. This model Michigan can lift 15,000 lbs.

#### 2¾ yard Michigan

2 yard Model 125A and most of the 2¾ yard Model 175A's busy most of the time. Good mobility and unexcelled breakout, equally great through the entire lifting arc, make quick work of this job. The Model 125A needs only 3 minutes to heap a typical 10 yard truck . . . the bigger Model 175A's require only 2 to 2½ minutes.

#### 24 mph travel speeds odd jobs

Michigan speed pays off on odd jobs, too. Like cleanup of haul roads, stockpiles, and around crushers. Pushing loaded trucks up grade. Setting utility poles. Hoisting crusher screens and other heavy equipment. Switching railroad cars (up to 25 empties at once). Plowing and removing snow. Despite year-around work averaging 50 hours a week, company officials report "downtime negligible." And continuing, "The all-Clark-built, all-matched power train sure boosts efficiency. From power shift, power steer and 3-to-1 torque converter to planetary wheel drive axles . . . our '54 model has the same components as our newest rig . . . which certainly proves

how good the Clark design is. We like the speed of loading... the speed between job sites... the excellent performance on emergency rock-handling... the lack of downtime... the ease of maintenance. That's why we've been repeat-buyers five times!"

#### Make your own test

A demonstration, gladly arranged by your local Michigan Distributor, will show you why you too should be a Michigan Tractor Shovel buyer. Put the demonstrator on your toughest loading jobs . . . we'll bet our cost of the demonstration against your time you'll really be enthusiastic about the results.

Michigan is a registered trade-mark of



CLARK EQUIPMENT COMPANY
Construction Machinery Division
2473 Pipestone Road
Benton Harbor 42, Michigan
In Canada: Canadian Clark, Ltd.,
51. Themat. Others.



EVEN A HALF MOUR of down time on a big stripping shovel like this one is extremely expensive. So the owner, Tasa Coal Company, uses USS "T-1" Steel extensively to increase service life. Tasa has experienced no failures of USS "T-1" Steel even when it takes hard daily pounding at below-zero temperatures.



WELDING USS "T-1" STEEL plates to worn, cast bucket teeth. "T-1" Steel has tripled life of the teeth.

AUGER CUTTER HEADS get battered and abraded in really hard service. This entire head, except teeth and holders, was recently rebuilt by Tasa Coal Company with USS "T-1" Steel to insure good service life and to minimize repairs and maintenance.



#### In tough mining equipment . . .

# WELDABILITY OF USS "T-1" STEEL PAYS OFF IN BUCKET REPAIR

The original bucket on Tasa Coal Company's 18-cu.-yd. stripping shovel was badly worn. The culprit, of course, was tens of thousands of tons of rock and dirt. So when newbucket-time came around, Tasa felt they could increase service life by building the new bucket in their own repair shop from tough, strong USS "T-1" Steel plate. Results have been excellent!

#### No Fabricating Problem

The shop foreman told us that he had no difficulty welding USS "T-1"

Steel. The welds have held up extremely well. After weeks of hard service in sub-zero temperatures they show no signs of cracks.

#### Other Applications

Tasa Coal Company has had good success fabricating USS "T-1" Steel for other parts, too. They weld ¾-inch USS "T-1" Steel plates, quenched and tempered to 321 minimum Brinell, to bucket teeth and thereby triple service life—increase it from just 5 days to 15 days.

USS "T-1" Steel has found a

home in many mining applications. Its weldability and formability facilitate fabrication, while its very high yield strength of 90,000 psi and its amazing toughness and resistance to impact-abrasion help to reduce weight or increase durability.

#### Write for new technical bulletin

Our new booklet, called "T-1," gives you much useful information on fabrication procedures and possible uses for this versatile alloy steel. Write for it today!

UNITED STATES STEEL CORPORATION, PITTSBURGH - COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS - UNITED STATES STEEL EXPORT COMPANY, NEW YORK





# Morton "Formula 5" with rust inhibitor protects your coal and your equipment

"Formula 5" is the safest, most effective freezeproofing compound you can buy. Morton "Formula 5" is specially compounded to meet the requirements set up by coal producers. Unlike ordinary freezeproofing compounds that contain corrosive chlorides, non-toxic "Formula 5" has a rust inhibitor added to help protect you (and your customers) against corrosion of motors, conveyors and other equipment.

Effective even at sub-zero temperatures, "Formula 5" not only keeps coal free-running for your customers, it also is ideal for use anywhere around your mine where icing is a problem.

#### "Formula 5" is economical to use

In addition to being a multi-purpose freezeproofing compound, 'Formula 5' needs no mixing, no special handling. It won't cause costly delays by caking or lumping in feeders. It's a free-flowing product composed of chemically treated sodium chloride (30-70 mesh) and a special anti-corrosive compound. Just apply dry direct to coal.

"Formula 5" is treated to produce an ideal dissolving rate so that little of it is lost during initial drainage. This means more effective, more economical freezeproofing.

#### Send for free technical help today!



- ☐ Please send me your free booklet, "The Key to Low Cost Freezeproofing Application."
- I also would like a Morton Consulting Engineer to assist me, without cost or obligation, on problems of freezeproofing and equipment maintenance.

 Name

 Company

 Street

 City
 Zone

 State

#### MORTON SALT

INDUSTRIAL DIVISION

Dept. CA-9, 120 So. La Salle Street, Chicago 3, Illinois



#### More round trips per shift and bigger payloads with JEFFREY SHUTTLE CARS

Class 68 Shuttle Car-heights from 24 to 32 inches; capacities from 2.4 to 3.9 tons; average speed 3.2 MPH fully loaded, 3.5 MPH empty. Though having a low basic height, it embodies all features of design and operation found in higher cars.





Class 66 Shuttle Car-heights from 30 to 48 inches; capacities from 2.7 to 6.1 tons; average speed 4 MPH fully loaded, 5 MPH empty. 66A in basic heights of 30" or 36" with maximum of 42" using sideboards. 66B in basic heights of 36" or 42" with maximum of 48".

Class 67 Shuttle Car-heights from 44 to 60 inches; capacities from 4.6 to 9.2 tons; 88" or 96" wide; average speed 4.2 MPH fully loaded, 4.9 MPH empty. 67A in basic height of 44" with maximum of 55" with sideboards. 67B in basic heights of 48" or 54" with maximum of 60".





Class 90 Shuttle Car-low cost, heavy duty . carries up to 8 tons. Trams at an average of more than 4 MPH. Unloads in less than a minute. 44" and 50" basic heights with 4", 6" or 8" sideboards.

Four-wheel drive with no-slip differential between wheels on the same axle... four-wheel steering ... four-wheel disc type hydraulic brakes... full magnetic, progressive series-parallel acceleration with hand-selection series position; all add up to account for the high degree of maneuverability offered by Jeffrey shuttle cars.

Loading and unloading are fast, because the operator has the aid of the variable speed, hydraulically driven discharge conveyor. It can be reversed instantly to clear jammed lumps. Jeffrey shuttle car payloads can be matched to your mining height.



THE JEFFREY MANUFACTURING COMPANY
912 North Fourth Street Columbus 16, Ohio



For all Jeffrey Colmols, including the new 86A low Continuous Mining Machine, there are Firthite Blue Bit Mining Tools available for bore arm, kerf and base chain positions in grades to suit every mining condition.

Many operators have "standardized" on famous Blue Bits to achieve the maximum efficiency possible from their automatic mining machines.

To help you select the exactly right tools and cor-responding holders for the conditions in your field, refer to the handy condensed table at the right. If in doubt or when special conditions prevail, a Firth Sterling mining tool engineer will be glad to discuss the problem and recommend a solution.

Position	Recommen Tool Number	ded Holder	Cutting Conditions	Coal		
Bore Arms	CA-7 C-7-M	1/2 x 1	Light to Med.	Relativety Clean		
	CM-7	½ x 1 Topered	Med. to Hvy.	Occasional Impurities		
	CMC	1/2 x 1	Heavy	Large Quantities Clay—Sulphu Rock, etc.		
Kerf	C-7-M	1 x 1	Average	Average		
Base	CM-7	1/2 x 1	Med. to Hvy.	Av. Bottom		
Chain	CMC	1/2 x.1	Heavy	Rock Bottom Clay Rolls, etc		

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA. DISTRIBUTED BY:

AUSTIN POWDER COMPANY—Cleveland, • DUNLAP WELDING & SUPPLY—Zanesville
Waynesburg, Evansville, Madisonville, • MOLE-BITS COMPANY—Johnstown
Hazard, Clarksburg
• U. S. STEEL SUPPLY DIVISION—Pittsburgh
UNION SUPPLY COMPANY—Denver
• CARL B. LEWIS—Scranton

UNION SUPPLY COMPANY—Denver

AMOS A. CULP—Birmingham

ACCOMB SUPPLY COMPANY—Harian

CARL B. LEWIS—Scranton

GUYAN MACHINERY—Logan

THE RAINS SUPPLY CO.—Sait Lake City

CARLSBAD SUPPLY COMPANY—Carlsbad

SOUTHWESTERN ILLINOIS SUPPLY—DeSoto SERVICE SUPPLY COMPANY—Wheeling • COAL BIT COMPANY—Prestonsburg

YOUR AUTHORIZED FIRTH STERLING MINING DISTRIBUTORS HAVE COMPLETE STOCKS FOR IMMEDIATE DELIVERY

R 332

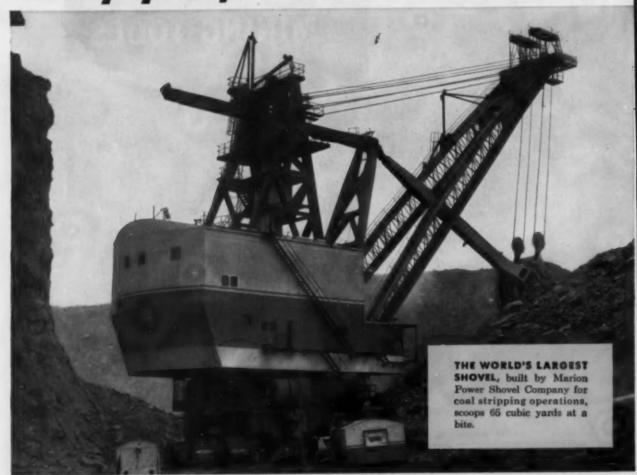
PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels Tool and Die Steels Stainless Specialties High Temperature Alloys



Sintered Tungsten Carbides Firth Heavy Metal **Chromium Carbides** High Temperature Cermets

# Every year, THE WORLD'S





DIPPER HOIST ROPES are 21/2"-diameter Tiger Brand 6 x 49 Excellay Preformed.



TIGER SRAND 3%" boom-support strand has been used by coal companies since 1949 and has proved safe in service on big shovels.

#### LARGEST SHOVEL could

#### load a train 3,460 miles long

THE world's largest shovel moves an average of 1,614,530 cubic yards of overburden a month. In 12 months, this would fill a train of 70-ton coal cars 3,460 miles long.

The wire rope that performs this miracle is USS American Tiger Brand 6 x 49 Lang Lay Monitor Excellay with Independent Wire Rope Core. Two ropes 2½" in diameter and 580 feet long hoist the huge bucket that scoops up 90 tons at a bite.

The shovel can deposit a load in 45 seconds and be ready for the next scoop. This is one reason for the high production rate.

The boom supports have a catalog strength of 768 tons each, making a total of 3,072 tons for the four strands. These consist of 115-foot lengths of 35%-inch Tiger Brand Galvanized Boom Support Strand. The big advantage of boom-support strand over wire rope for this application is that if any breaks occur in individual wires, they show up first on the outside layers and are clearly visible.

The use of 35/8"-diameter strand for boom supports on large shovels was introduced in 1949 as a result of the combined studies of coal company engineers with those at American Steel & Wire. It is a proven boom-support assembly which has become increasingly popular. Let us give you the facts.



THE BIG BOOM is 150 feet long and is supported by four 35%"-diameter Tiger Brand Galvanized Boom Support Strands with a minimum breaking strength of 768 tons each.

AMERICAN STEEL & WIRE DIVISION

United States Steel, General Offices: Cleveland, Ohio

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors

Tennessee Cost & Iron Division, Fairfield, Ala., Southern Distributors . United States Steel Export Company, New York

USS AMERICAN TIGER BRAND WIRE ROPE

Excelley Preformed -



UNITED STATES STEEL

# SEE TIMKEN TELEVENTS ON NETWORK TV

Two big hour-long spectaculars this fall



Over 126 NBC STATIONS, SEPTEMBER 23rd

"Eleven Against the Ice", the story of the Antarctica Turnpike. See men and machines build a trail across Antarctica's frozen wastes—in spite of 200 mph winds, temperatures of 120 degrees below zero and crevasses big enough to swallow a 20-story building. It's a triumph of engineering and human courage, a whale of a television show.



Over 142 NBC STATIONS, NOVEMBER 21st

"The Innocent Years". Recaptured from exciting old films and newsreels, you'll see happy days relived. Experience the excitement of "Teddy" Roosevelt, Thomas Edison and Mark Twain in action. Hear songs like: "In the Good Old Summertime", "He'd Have to Get Out and Get Under". Enjoy the fun of family picnics, the joys of people in the last untroubled time in our history.

#### And commercials that help you sell ...



See How man stumbled on the concept of the wheel.



See Why America's railroads have always led the world.



See Why Americans jump for the latest thing in cars.



See One man push a freight car all by himself.

Years of national and trade advertising, backed by their superior performance, have made "Timken" the best-known name in bearings—a name that helps to sell the products that use Timken® bearings. Now, network television will build even a greater awareness of Timken bearings—make them an even bigger sales plus in the equipment you sell. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

#### TIMKEN TAPERED ROLLER BEARINGS



#### Ashland Permatreat Coal Spray Oil — Lasts the life of the coal!

- DECREASE WATER ABSORPTION—Permatreated coal repels water.
- FREEZE PROOF—Permatreated coal resists freezing and eliminates frozen car pockets.
- REDUCE MOISTURE—Add 300,000 BTU per ton for each 1% reduction in moisture.
- DUST PROOF—ODORLESS—Permatreated coal insures dustless deliveries and handling, odorless storage and burning.
- ELIMINATE WINDAGE LOSS—that results in lost weight claims and air pollution complaints.
- AVOID CORROSION Non-corrosive Permatreat can't pit or corrode stoker equipment, or rolling stock.
- MAINTAIN QUALITY Permatreat reduces deterioration from weathering.
- CONTROL BULK DENSITY—Permatreat insures uniform coke production and quality.
- SPECIAL ADVISORY SERVICE—Available from nationally recognized authorities on coal treating.

ASHLAND OIL & REFINING COMPANY
Ashland, Kentucky





Here's complete information on how you can streamline your weighing operations and simplify all your data processing—ELECTRON-ICALLY.

The new Fairbanks-Morse line of weighing equipment enables you to install a completely new electronic weighing system or convert your present truck or axle load scale to full electronic efficiency.

You'll also want to see the latest in Fairbanks-Morse warehouse scales, portable scales in the new F-M Floaxial Dial Series.

#### Check the Literature You Want . . .

Axle Load Scales, Capacities to 30 Tons. Bulletin ED-10. Motor Truck Scales, Capacities to 50 Tons. Bulletin ED-11. Attachment for operation of adding machines, typewriters, etc. Bulletin ED-16. Warehouse Dial Scales, New Floaxial Series. Bulletin 8105. Bench and Portable Dial Scales, Floaxial Series. Bulletin 8102.

Mail today...Fairbanks, Morse & Co., Dept. CA-9, 600 S. Michigan Ave., Chicago 5, Ill.



FAIRBANKS-MORSE

a name worth remembering when you want the BEST

SCALES . PUMPS . DIESEL LOCOMOTIVES AND ENGINES . ELECTRICAL MACHINERY . RAIL CARS . HOME WATER SERVICE EQUIPMENT MARNETOS



This 3/4-yd. Bucyrus-Erie 22-B shovel is loading out coal in an open-pit mine near Clarion, Pa.

### Here's a long term investment in cost-saving mechanization

An important added advantage of mechanizing with Bucyrus-Erie shovels is the extra years of efficient service they perform. Here are just a few reasons why:

Bucyrus-Erie controls the quality of every component. Each lot of steel undergoes standard metallurgical tests to ascertain if our rigid specifications have been met and where conditions warrant it photomicrographs are made to permit a study of the grain structure. Bucyrus-Erie is one of the few companies that pours its own castings, in foundry facilities unsurpassed in the industry.

And just as important — each model is engineered completely new from the ground up. Existing machines are not "modified" simply to create a "new" model.

This attention to quality in design and manufacture results in machines requiring minimum upkeep and adds years of service life. Your Bucyrus-Erie distributor has complete details on machines from 3/8- to 4-cu. yd. For information on larger capacity loading and stripping shovels, write direct.



Bonus Quality Bucyrus-Erie leaves nothing to chance. This sample furnace charge, like all others, will be thoroughly tested to insure that its properties meet the highest specifications. It's just added insurance to guarantee top excavator performance.



SOUTH MILWAUKEE, WISCONSIN



ENGINEERING REPORTS: Powered by General Electric system . . .

New 55-cu. yd. stripper



### removes 5000 tons per hour

### Huge Bucyrus-Erie shovel built for River Queen mine removes 90-foot overburden, has 55-second duty cycle

At River Queen mine in Western Kentucky, the largest power shovel ever built by Bucyrus-Erie Co. strips 90-foot overburden at a rate of more than 5000 tons per hour. Built for Peabody Coal Company and W. G. Duncan Coal Company, joint owners of the mine, the 55-cubic-yard "River Queen" makes possible the simultaneous recovery of two coal seams, separated by a five-foot rock parting.

For this immense project Peabody, which operates the mine, specified General Electric equipment for the shovel's electrical system. General Electric engineers worked together with Bucyrus-Erie and Peabody engineers to design and install the electrical system.

Highlights of the electrical system are nine rugged G-E direct-current motors to

power hoist, swing and crowd motions; four 200-hp induction motors to power the propel motion; quick-response amplidyne\*-amplistat\*\* control system which permits one man operation; and a 3750-kva substation that is skid-mounted for mobility over rough mining terrain.

R. T. Taylor, Peabody electrical engineer, discussing the shovel's electrical system and performance, stated that Peabody has had excellent experience with G-E equipment in the past, and the equipment in the River Queen shovel has lived up to expectations. In any phase of mining operation, G-E engineers and equipment can work for you. For information contact your local G-E Apparatus Sales Office or write General Electric Co., Section 663-47, Schenectady 5, N. Y. \*\*Amolities amolities developed by General Electric Co.



PROJECT PLANNERS include (1. to r.) R. M. McElwee, G-E sales engineer; R. T. Taylor, Peabody engineer; and J. E. Payne, Bucyrus-Erie field erection engineer.



HEAVY LOAD DEMANDS of hoist motion are met by four new General Electric MD-620 directcurrent motors, rated 375-hp each.

### GENERAL ELECTRIC

Engineered Electrical Systems for the Mining Industry



MAXIMUM direct-current output under heavy loads for River Queen shovel—up to 6000-hp—is provided by two General Electric synchronous motor-generator sets.

FAST RESPONSE and high-accuracy one-man control of River Queen shovel motors is provided by reliable General Electric amplidyne-amplistat electrical control system.





MOBILITY over rough mining terrain, obtained by a specially-constructed skid-mounted 3750-kva substation, places incoming power near shovel, minimizes voltage drop.

TRACTION POWER to propel massive, 2400ton River Queen is supplied by four heavy-duty General Electric 200-hp woundrotor induction motors (one shown).





HIGH TORQUE General Electric direct-current MD-616 motors, rated 187½-hp each, power crowd motion of giant dipper, givelong life.



## Want higher productivity— Get both with LONG



## T

#### New Long Model 88-C Pigloader\*

For Piggyback\* Conveyor Mining Overall Operating Height—25¾ inches Weight—14,000 pounds.

These new Pigloaders feature low operating height, simplified design and operation, minimum maintenance, and full independent crawler control. The single 40 HP electric motor drives all machine operations, with power transmitted to various functions through a simple combination of gear and chain drives. All functions are controlled hydraulically from a single bank of fingertip

#### New Long Model 188-C Pigloader

For Shuttle Car Loading Overall Operating Height—261/4 inches Weight—15,000 pounds.

control valves. Maximum digging power results from application of extremely heavy duty gathering transmissions, plus the ability to employ the full 40 HP for this as well as other operations. Rated capacity—4 to 6 tons per minute; tramming speed—95 feet per minute; conveyor chain—heavy duty, 58,000 pounds ultimate strength.

\*Trade Marks Reg. U. S. Pat. Off.



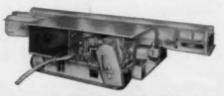
#### **Long Piggyback Bridge Conveyors**

The LONG Piggyback is the original "bridge" conveyor, with basic features patented. Because it eliminates lost time for shuttle car changes, Piggyback mining assures continuous haulage and a high percentage of loading time—whether utilized with conventional loaders or with continuous mining machines. The PT-15-B (illustrated) is especially suitable for use with the 88-C Pigloader. For low seams, the new LONG PT-18 Piggyback has a receiving height of only 11".



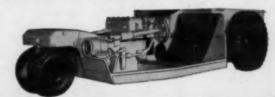
#### New Long Mobile Hydraulic Coal Drill

Coal drilling becomes a one-man operation with the new LONG Mobile Hydraulic Coal Drill. Two lightweight aluminum drills are available—the 1-M-20 (one-man, 20 pounds) for drilling average holes and the 1-M-30 (one-man, 30 pounds) for larger holes or drilling in hard coal. 12-20 seconds is required to drill the average hole WITH ONE MAN. The self-tramming hydraulic power unit designed for these drills also can be used with a trailer for supply haulage or conveyor pan movement.



#### Long Mobile Room and Gathering Conveyors

The LONG Mobile Conveyor reduces moving time by as much as 60 per cent. Because the conveyor drive is crawler mounted and self-tramming, one man can relocate it in minutes. Tramming speed—45 fpm, capacity—5 tons per minute, and operating length—more than 400 feet. Available in Model M-400 (open-type pan track return) and M-500 (solid-type recirculating pan track return) with pan widths of 12 and 15 inches and pan depths of 5, 7 and 9 inches. The M-500 series eliminates fine coal accumulation under the pan line, and cleaning up after this conveyor is unnecessary.



#### **New Long Battery Tractor-Truck**

Equipped with U.S.B.M. permissible approval plate, the new LONG Model D-2375 travels at a speed of 4 miles per hour and can quickly move trailers carrying sufficient supplies for an entire working shift, plus the men, to the section. Available in machine heights of 26" or 30", it incorporates explosion-proof U.S.B.M. approved type electrical equipment with full magnetic control, and two-speed operation in each direction.

lower operating costs?

### EQUIPMENT

FOR

## Continuous loading... Mobile conveyor mining



Side-Lift Type-Model 2374



Straddle Type-Model D-2111

#### **New Long Conveyor Pan Transporters**

Designed specifically for application of the LONG Piggyback Conveyor System to continuous mining, these pan transporters permit quick, easy additions to the room chain conveyor to keep pace with rapid advances by continuous mining machines. The straddle type, powered by two U.S.B.M. permissible 5 HP motors, can transport at one time six

or seven conveyor pans (each 6' long), plus tail piece.
Powered by one permissible 10 HP motor, the side-lift type has two side-lifting booms for transporting three conveyor pans, plus tail piece, to

porting three conveyor pans, plus tail piece, to extend the room conveyor. Also included with this model is a hydraulic driven winch with 150 feet of wire rope.



#### Long 400-DBH Skid-Mounted Conveyor

High capacity transportation is provided by the LONG 400-DBH, 15-inch room and gathering conveyor, designed for LONG Piggyback Conveyor Mining. Furnished with 5", 7" or 9" deep pans—the 400-DBH offers capacity to 300 tons per hour in maximum lengths of 500'. Standard chain speed is 196 fpm.



#### Long Type 640 Elevating Conveyor

Provides high-capacity transportation as either a shuttle car elevator or an elevating conveyor in the LONG Piggyback Mining System. It offers the strongest chain and flight combination in an underground elevating conveyor, and its 10¾" height makes it desirable for receiving shuttle car loads. Open or permissible type electrical equipment.



#### MAIL COUPON FOR COMPLETE INFORMATION!

Gentlemen:

Please send details on the complete line of LONG Equipment

C-----

Company

Address

City\_\_\_\_\_Zone\_\_State\_\_\_\_\_



\*Lower preparation costs with

## ATIRIDOX

NON-EXPLOSIVE MINING METHOD



NON-EXPLOSIVE MINING METHOD
Cuts Costs 5 Ways

- Produces less fines in face preparation
- Rolls coal forward for faster, easier loading
- Easier on "tender" roofs—cuts timbering, bolting
- Lowers cleaning costs by minimizing
- Reduces degradation—no shattered coal



says Mr. Arthur S. Macke
Vice-President Operations
Mid-Continent Coal Corporation

Lower cost of coal preparation is only one of the many advantages that Mid-Continent obtains by using AIRDOX. Mr. Macke adds that:

"Minimum degradation by use of AIRDOX maintains size consistency of finished product.

"Less fines and uniform shape of coal results in better cleaning.

"Safety factor in mining of coal with AIRDOX is outstanding."

Prove to yourself that AIRDOX can bring these benefits to your mine. Write for free survey.

#### CARDOX CORPORATION . 207 NORTH MICHIGAN AVINUE - CHICAGO I, ILLINOIS

WAREHOUSES and DISTRICT OFFICES

Horper, West Virginia Phone: Clifford 3-4812 Benton, Illinois Phone: Benton 8-3821 St. Clairsville, Ohio

Pikoville, Kentucky Route 2, Box 99 Phone: Robinson Creek S

Louisville, Colored Phone: Boulder Hillcrost 2-7298 Library, Pennsylvania
Box 427
Phone: Library Tennyson \$-6910

Phone:

Evansville, Indiana
307 Northwest Fifth St.
Phone: Evansville 2-894

Ottomws, Jawa Phone: Ottomws Morray 4-6564

## powered by White's Superior Diesel



#### Manitowoc 4500 cuts Ohio Stripper's cost

20%

Careful equipment selection is paying off for Terramana Brothers Coal Co., Steubenville, Ohio. For digging into 70 feet of overburden, they chose a Manitowoc 4500 shovel . . . and wisely specified the rugged, dependable White Superior Diesel for power. According to Terramana Brothers, this perfect combination greatly increased production and cut operating costs . . . resulting in more than 20% overall savings!

The big 4-yd. rig with a 60-ft. boom and a 45-ft. stick works two 10-hour shifts daily, powering away almost 400 yards per hour. The high torque Superior engine provides more line muscle... it pulls a full dipper with little effort. Under light load, it enables swings at top speed without surging. The faster and smoother cycle increases production!

Many cost saving advantages of Superior's design sim-

plicity also contribute greatly to this economy. Easy accessibility of internal parts speeds servicing in close quarters. Down-time is practically eliminated because maintenance and repairs are reduced to a minimum. Many case histories show 35,000 engine hours with no major replacement parts required. Superior's first valve job usually comes due long after other engines would be completely replaced! Highly developed, open chamber combustion achieves optimum air and fuel mixture, low fuel consumption and easy starting. Precision construction throughout reduces wear and assures lowest lube oil consumption.

Specify White's Superior Diesel on your next new shovel or when you're re-powering. Power ranges from 225 to 2150 B.H.P. for all types of service. Write for complete

information today.



### White Diesel

WHITE DIESEL ENGINE DIVISION THE WHITE MOTOR COMPANY

Plant and General Offices: Springfield, Ohio

when you put Bowdil Bits

in a Bowdil Chain

on a Bowdil Bar ...



The BOWDING Company

this is the TS-360

15 yd struck 20 yd heaped 280 horsepower

this is the TS-260

11 yd struck 14 yd heaped 200 horsepower



**ALLIS-CHALMERS BRINGS YOU ANOTHER** NEW MEASURE OF MOTOR SCRAPER PERFORMANCE



the TS-160

# NEW Allis-Chalmers TS-160

7 yd struck
9.5 yd heaped
155 horsepower
5 speeds to 25.4 mph
12-ton payload

### Measure these advantages for

GLLIS-CHALMERS

**22** hp per struck yard—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. Versatile TS-160 can team up with big equipment or work alone on long- or short-haul stripping jobs—handle a wide range of utility jobs, travel at speeds up to 25.4 mph.



Measure these features . . . Allis-Chalmers 516-cu-in. diesel engine—dependable power at all working speeds • Independent, constant live hydraulic power for steering and scraper operation • Low, wide bowl—8-ft, 1½-in. cutting edge . . . 3-piece, interchangeable cutting edges . . . double-acting hydraulic bowl lift jacks • Positive hydraulic ejection, high apron lift to full 7-ft, 1½-in. opening • Roomy operator's compartment, easy-to-reach controls, 24-volt direct electric starting, adjustable bucket-type seat, synchronized 4-wheel air brakes • Big push block for all types of pushers—positioned for in-line push • Full-circle visibility while loading, spreading and traveling 2.20 operating ease under all conditions • 17¾-in. minimum ground clearance in hauling position.



### a wide range of earthmoving jobs...

Turns non-stop in less than 25 ft with 90degree hydraulic steering...easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

Moves quickly from job to job... when required, transport wheels are available to meet legal load limits for highway travel.



Allis-Chalmers, Construction Machinery Division
Milwaukee 1, Wisconsin

#### **ALLIS-CHALMERS**

Engineering in Action



GENTLEMEN: Have the Allis-Chalmers Construction Machinery dealer serving my area arrange a demonstration of the TS-160 motor scraper for me ...

Name.

Address

City\_

State\_

Type of work\_

## Loaded and ready — with less hazard from stray currents

### PRIMACORD® DETONATING FUSE

This hole is loaded and ready to go — but only when you say the word. All danger of a premature shot is reduced to the minimum, because the detonating agent is Primacord. It cannot be set off by sparks, friction or ordinary shock, but must be detonated. It is not affected by stray electrical currents, and even a direct hit by lightning failed to detonate it.

#### THE ENSIGN - BICKFORD COMPANY

Simsbury, Connecticut . Since 1836

Primacord® Detonating Fuse, Ignitacord®, Quarrycord, Safety Fuse,
Pyrotechnical Devices and Blasting Accessories

Reinforced Primecord Trunk Line also recommended for deep holes where normal strength and resistonce to obrasion and outring are needed. Textile reinforced (yellow with red throad), lough, resilient, flexible. Tenuite strength 170 lbs. 1000-th. spool weighs 18 lbs.

Plastic Reinferced Primecurd Branch Line, recommended for extremely desp boles — also river crossings and other wet conditions. Covered with a tough plastic material — waterproof and resistant to acids commonly encountered. Tensile strength 250 lbs. 1000-ft. speol

Knot shown is the dove hitch, made in Plain or Reinforced Primacord and drawn lightly around the Plasti Reinforced Primacord. Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry



IVAN A. GIVEN, EDITOR

SEPTEMBER, 1957

### **Enough Demand**

BETWEEN NEW PROPERTIES and modernization and expansion of existing operations, the bituminous industry is increasing its productive capacity substantially. Whether it will reach the 675 to 700,000,000 tons that some estimates call for in 1960 still is a question, but there is no doubt that the increase is major and that it will take place. This has led to increased expression of concern as to whether demand will absorb enough of this increase to permit maintenance of sound pricing policies.

If the pessimistic viewpoint is accepted, the increase in capacity could mean trouble. This approach envisions a further decline in coal's percentage of the total energy supply, and thus only nominal growth in tonnage in spite of the overall increase in energy use. But is it necessary to accept this viewpoint? Even if there was no increase in energy use in the years ahead, a reasonable expansion of coal's share of the present market would absorb a great deal or all of the planned expansion of productive capacity. The key is increased emphasis on exploiting the market. If this is done as it should be in the years immediately ahead there should be business enough to require all the planned producing capacity-and more.

#### Still Needed

THE ODDS continue in favor of the view that the administration's attempt to get voluntary limitation of oil imports will fail and that mandatory controls will have to be imposed in the interest of national security. The failure will not necessarily be a result of defiance by the oil importers, but rather because the pressures will be such that a voluntary system cannot withstand them.

The import quotas established for the major companies, for example, are necessarily somewhat arbitrary and consequently pressure for modification will be heavy. Also, certain trade agreements—with Venezuela, for example—contain clauses which would make it difficult to

reduce imports from those countries. And certain importers can increase takings without limit, in addition to the further complication resulting from the fact that no limitations have been placed on the import of products, including residual.

So, the problems of oil imports are still to be solved, and with them the problems of gas imports and, in fact, most of the questions involved in meeting the growing energy needs of the Nation. In short, the United States still is a long way from a practical fuels policy, not only to advance national security but also to promote the orderly growth of ability to serve the needs of the country's growing population and industry. Possibly the present hassle over oil imports will bring formulation of such a policy a little closer. If so, it will have served a useful purpose.

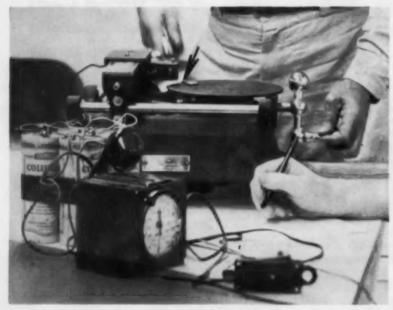
#### Not Obsolete

IS THE BLAST FURNACE on its way out of the steel industry? If so, does that mean the end of a big coal outlet? A hasty reading of recent reports on processes for the direct reduction of iron ore might leave one with that impression. But it would be an erroneous one.

This is not to say that direct-reduction processes, including the two summarized in this issue's news section, are not destined for increasing use. But even though the blast furnace is eliminated, there still must be a reducing agent. In one process it will be supplied directly by carbon, but in a different form. The logical source is coal. In the second process, the agent is hydrogen. Again, coal is a highly likely source of low-cost hydrogen in large volumes.

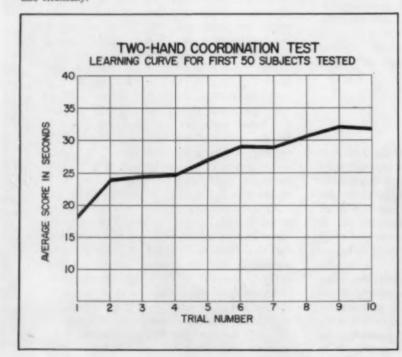
As of the moment, therefore, the situation boils down to this. Direct-reduction processes will come in and take over more and more from the blast furnace. However, the rate of growth necessarily will be slow—at least for a time. Second, coal still is the logical source of the reducing agent and, if the new processes reduce the percentage of scrap used, it might find itself with an even larger opportunity. Summing up, the blast furnace may become obsolete, but it does not follow that coal will too.

### Testing to Select Better Personnel



ABILITY to manipulate objects with hands may be closely related to capacity for learning to operate machinery. Acting on this theory, the Pyschology Dept., West Virginia University, has borrowed the Air Force's two-hand coordination test device above for experiments. Initial data are encouranging . . . .

CHART shows how device measured learning capacity of first 50 subjects tested at Hanna Coal Co.'s Ireland Mine, Moundsville, W. Va. Average scores doubled between first and tenth trials. Score is recorded in seconds per minute subject maintains contact between pointer (see arrow, photo) and button to its right which traverses disc erratically.



Hanna Coal Co. and West Virginia University report on developing psychological tests for upgrading accuracy in personnel selection and placement.

By Harold L. Durrett Personnel Manager Ireland Mine Hanna Coal Co. and Dr. Quin F. Curtis Head, Philosophy And Psychology Dept. West Virginia University

### For Coal Mining Today

PSYCHOLOGICAL TESTS for selection and placement of personnel have been used by other industries with varying degrees of success for the past 30 yr. That a similar approach to coal's personnel problems is feasible was demonstrated by Mr. C. R. Nailler in a paper, "Personnel Evaluation and Training," presented to the American Mining Congress in Cleveland, May 15, 1957. Mr. Nailler discussed the fruitful use of tests by the Christopher Coal Co., Osage, W. Va.

As far as we know, testing was introduced into the mining industry in West Virginia about 1946. Since that date, only sporadic experimentation has been carried on in this field because of fluctuating economic conditions in the industry. Since today's relatively high wages are established by contract and layoffs are executed in order of seniority, it is more crucial now than ever that personnel selection be as efficient as possible. We can no longer afford the luxury of trial-and-error hiring.

The recent revitalization and expansion of the mining industry has necessitated the hiring and training of many new personnel. Fortunately, the abundance of job applicants affords an opportunity to staff mines with the very best men providing we can pick them out. Since any device which will facilitate this screening process is valuable, several companies have recently begun the use of psychological testing. At this time, however, most testing programs are still in the experimental stage and have not yielded the kind of results ultimately expected.

#### Measuring Ability

When we plan tests to help discriminate between those likely to succeed and those whose chances are poor on a particular job, we must first determine what it is that makes the difference between success and failure on the job, or what the job requirements are. In other words, we must determine what demands a particular job makes upon the individual performing it. Determining the requirements of a job cannot be a perfunctory observation, but must be a thorough and systematic analysis by one trained in this field.

The next step is to select a test believed to measure the aptitude, ability or trait required for successful performance. In this respect, test validation is not unlike drilling for oil.

Anyone might intuitively select a drilling site at which oil could be found but most drillers require the services of a geologist since he is much more likely to select a good site for drilling. The successful selection of a test is also more probable when performed by an expert trained in the field. But even an expert occasionally strikes dry holes, and an expert may also select a useless test. In either case, the lost expenditure may only be regained by continued experimentation. In the final analysis, the gushers drilled must more than pay for dry holes struck or operations are conducted at a loss.

When a test has been decided upon, it is then administered to present employees or to job applicants as they are hired. The degree of success on the job shown by the high scorers is then compared with the job success of the low test scorers, thus providing a means for measuring the validity of the test. This process is repeated continuously as long as the test is in use.

Test results are only reliable to the extent that they demonstrate the differences between successful and unsuccessful employees on the job. To our knowledge, none of the tests now used in the W. Va. mining industry have undergone sufficient experimentation to show validity for successful use. To state it differently, we are drilling at several locations, have found some small oil deposits, have struck no gushers, but are very optimistic.

Because of its widespread success in forecasting success in other situations and especially in other industry, a mental ability test is now an integral part of all test batteries presently used by the industry. This seems logical since efficient performance of most jobs depends to some extent upon learning or profit by practice. The Revised Beta Examination, a general mental ability test which minimizes the effects of formal education and reading ability, is now being used by several companies in the selection of contract personnel. Other tests such as The California Test of Mental Maturity and The Civilian Edition of the Army General Classification Test are being used for screening those considered for supervisory jobs.

Evidencing the worth of these tests:

 Most supervisors feel that they can detect some improvement in the quality of men hired where such tests are used.

- 2. As far as known, every good supervisor who has taken these tests has scored above average.
- One study now being conducted indicates strongly that the proficiency of mechanics is closely related to mental test scores.
- 4. When older supervisors at Ireland Mine were tested they averaged 110, while the average score of 42 certified job applicants seeking supervisory jobs was 98.

The extensive mechanization of recent years indicates that mechanical ability might well be a factor in determining success on many jobs, especially in the case of mechanics and maintenance personnel. Thus the Bennett Test of Mechanical Comprehension has been incorporated into our test battery. It is the only special aptitude test presently in widespread use. In a study now being conducted, scores on this test appear to be higher for good mechanics than for poor ones. The relationship between scores and proficiency, however, has not yet been accurately determined. At one property where eight supervisory employees took this test, the scores arrayed themselves in the same order as the salaries of these men with only one exception.

#### Measuring Personality

All the tests mentioned so far are intended to measure ability or aptitude, or what an individual CAN do. However, most would agree that what the individual WILL do is of equal importance. We must not fail to consider personality. Social contact is an unavoidable aspect of all industrial jobs. Therefore, a test which would tell something about a man's typical manner of dealing with other people could do much to aid in employee selection and placement. This should be especially true for supervisors. Personality tests have undergone the most extensive experimentation of all the tests now in use.

In the basic study performed by the psychology staff of West Virginia University in cooperation with a nearby coal company, 68 foremen of all levels were carefully rated as to their performance on the job. They were then divided into two groups, a top-rated group and a bottom-rated group. All foremen were then given the Minnesota Multiphasic Personality Inventory—a 390-item questionnaire covering various aspects of personality. The answers given by the two groups were compared, and 46 items

showing statistically significant differences were gathered together into a

special foreman's scale.

When the foreman's scale was used to score the tests given to the original 68 foremen, it showed remarkable power to pick out those who were rated tops in job-performance by correctly identifying 74% of the top group. Applied to 37 new foremen applicants, the foreman's scale agreed with 68% of the actual decisions to hire or reject these men. It has been in use for the past 2 yr for screening foreman applicants at this coal company. Follow-up results on the use of the test since that time are unfortunately not available in statistical form.

A second experiment involving the use of the Minnesota Multiphasic Personality Inventory to identify successful mine foremen was conducted recently in the southern part of the state by the Psychology Dept. of West Virginia University. This study involved 45 section foremen. As in the basic study, a foreman scale was devised which could successfully differentiate between top- and bottom-rated foremen with about 80%

accuracy.

Comparison of these two studies is both surprising and disappointing. The items which constitute the foreman's scale in each is almost entirely different, overlapping no more than would be expected by chance. In fact, several items which occur in both scales are answered in opposite directions by the top foremen of the two companies. Either scale, applied to the foremen of the other company, has substantially chance predictive power.

How can we account for these contradictory results? Without going into statistical complications, two explanations are possible:

- 1. In either or both companies, the foreman scale may have no actual validity outside of the particular group of foremen for which it was devised. If true, this means that the use of this foreman scale by one or both of the companies concerned would be useless for further personnel selection, unfair to job applicants, and a financial loss to stockholders. In other words, use of this scale should be abandoned.
- 2. An alternative explanation is that the personality traits leading to success in the two companies are entirely different, although measured to some degree by the two foreman scales. If this be true, one company cannot borrow a personality scale from another with any confidence that it will pick the kind of man who would rise to the top. As a result, each company would have to develop and validate its own

personality test. Further research will tell which of the two courses to follow.

#### Future Developments

What about future developments in psychological testing for the mining industry? Three lines of investigation show real promise of paying off.

One has to do with developing tests in entirely new areas of human ability which may be important for success on the job. For instance, manual dexterity or the ability to manipulate objects with the hands could very well be important in learning to operate machinery. S. R. Pursglove and Q. F. Curtis explored this idea in 1945 and demonstrated a possible coordination test consisting of a miniature electric

Experiments in this area are now being conducted at Ireland Mine with "Two Hand Coordination Test" which was used successfully in the selection of jet pilots in the Air Force. If this test makes it possible to choose in advance between those with and those without the motor coordination and space judgment required for efficient machine operation, it will obviate ill will, hurt feelings and costly interference with production.

A second line of investigation concerns the measurement of training or experience which is one of the most important factors in one's ability to perform all but the most menial jobs. Therefore, it becomes practicable to use any of several achievement tests designed to measure what the individual has learned about the particular job for which he is being considered.

Achievement testing, however, is often badly administered. For example, heavy reliance is so often placed on that pervading question which invariably appears in employment interviews: "How many years of experience have you had at such and such a job?" Who can be so naive as to expect that the calibre of a job applicant's future performance will be related in any way to his response to this question? Would we honestly expect a fellow who replied "ten" to give us more for our money than an applicant who says "five"? Yet most employers are guilty of this indiscretion.

A much more effective approach would be to employ oral tests consisting of questions about the specific job which only one skilled at the job would be equipped to answer. Why not ask, for example: "What would you check first if the ripper head on a 3JCM 5H wouldn't raise?" Such questions would be much more likely to reveal the benefits of experience as a mechanic. All jobs in which experience is an important consideration lend themselves readily to the compilation of good questions. Developing good oral trade tests would really pay off in the coal industry.

A third line of investigation concerns not new developments but the protection of what is already invested in the personnel program. The effectiveness of tests in use should be studied continually. The need for this is demonstrated by the paradoxical outcomes of the personality test studies in two companies referred to earlier. All that is needed to resolve this paradox is a second independent study of a new group of foremen by either of the companies concerned. The test results are at hand and the men are at work demonstrating daily their job success or the lack of it. But no one is putting information together in objective, cold, statistical terms to determine whether these tests offer a valuable tool or whether they are useless. Nothing will be accomplished by collecting haphazard impressions and testimonials about the effectiveness of personality tests.

Companies which have testing programs in progress or which expect to start them should bear in mind that the successful use of tests is definitely dependent on a generally sound personnel program. Furthermore, one company's program should not be expected to work for another com-pany. Personnel testing is a business venture and is not infallible. That a test picked out a good or a poor worker is no justification for its continued use. It must select a ratio of good to poor workers which is better than was experienced without the tests The decision as to whether a test works is a statistical one, not a matter

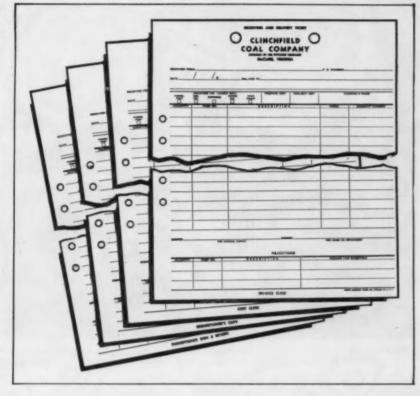
of someone's opinion.

Summarizing, a good sound personnel program which includes the use of psychological tests can:

- 1. Improve the quality of employees selected and batting averages in selecting them.
- 2. Upgrade the performance of those selected through testing by increasing their confidence in themselves and their pride in their company.
- 3. Lessen the misery caused and money lost by malassignments or by placing people in jobs for which they lack the aptitude.

Psychological tests can be a real asset in hiring or reassigning people, IF they are correctly used. They surely are a hidden liability when they are mishandled.

All necessary papers, incidental to receiving supplies, are prepared on the spot in a single writing by the receiving clerk.



RECEIVING-DELIVERY FORMS from a continuous register are prepared in quadruplicate to satisfy all files and interested parties.

### Simpler Supply Receiving

By George E. Toles Hamburg, N. Y.

A NEW RECEIVING SYSTEM, in which all necessary papers are prepared in a single writing by means of a portable register, has been installed by the Clinchfield Coal Co., Dante, Va., to expedite their receiving operations.

In the past, the receiving clerk checked the shipment received and the packing list against his copy of the purchase order to determine that all specifications were met. It was necessary for the night clerk, when he came on duty, to complete the proceedure by preparing a three-part delivery ticket from the vendor's packing list and freight bill to acknowledge receipt of the goods and for the internal aecounting department.

Delays in the report of receipt of shipments resulted in the delay in the payment of invoices, with the possibility of missing out on discounts. There also was the possibility of errors in payment since no provision was made for , delivery ticket copy for the invoice clerk.

P. E. Fleming, company purchasing agent, while making a study to work out a better system, came across a receiving system using a portable register adopted by an advertising display firm. From this idea, he developed a register system to overcome all of the previous disadvantages of the former system. Mr. Fleming was assisted by Moore Business Forms Inc. in selection of the proper register and with technical specifications of the firm.

The new system is based on a 4-part 8½ x 11 in Continuous Register Receiving-Delivery Ticket written in a portable register.

The register permits the receiving clerk to take it directly to the receiving dock to check the merchandise and make out his report on the spot. When a shipment is received he checks the material received, the packing slip and the freight bill and then writes up the Receiving-Delivery Ticket.

Part 1, the invoice clerk's copy (white), with freight or express bill attached, is sent to the invoice clerk who matches it with the invoice and makes payment at once.

Part 2, the cost clerk's copy (green), is forwarded to him for charging the requisitioner's department for the cost of the merchandise.

Part 3, the requisitioner's acknowledgment (blue), and part 4, the requisitioner's copy (salmon) are forwarded to the person who ordered the material. He signs part 3 and returns it to the purchasing agent who files it with his copy of the purchase order. Part 4 is retained by the requisitioner for his records.

The new system is saving time and money and providing better control for the company. Some advantages are:

- All necessary copies are prepared in a single writing and immediate distribution of parts can be made.
- Invoices can be processed and paid quickly, thus taking full advantage of discounts.
- 3. The form provides for recording an inspection report and any comments so that the invoice clerk can take immediate action.
- The night clerk is completely relieved of the additional receiving department duties.
- 5. The portable register permits the preparation of the necessary records right on the spot where the merchandise is received.



LOW-HEIGHT cleaning plant without internal conveyors saves structural steel and provides simplified flow. Use of loading conveyors to tower over tracks reduces plant height and makes it easier to dismantle and move, if desired.

### Faster Stripping, Simpler Cleaning

Using a faster dragline especially designed for two-seam stripping and cleaning the coal in a plant with no internal conveyors are operating features at Walnut Grove mine, Saxton Coal Corp. Average output is 3,500 tpd.



SAXTON OFFICIALS—Darwin Youngs (left), general manager; James Vaughn, preparation foreman; John Wible, superintendent, and Clifford Shepherd, pit foreman.

A NEW 10-YD DRAGLINE on crawlers and a compact preparation plant with minimum steel in the structure are features of the Harrisburg (Ill.) operation of the Saxton Coal Corp., which maintains home offices at Petersburg, Ind. The new project, Walnut Grove mine, consists of stripping two seams separated by an 18-20ft band of rock, washing 4x0 raw coal in a jig and loading sized clean coal on either or both of two loading tracks. Fine coal, 4-in x 28M, is mechanically dewatered in two centrifugal units prior to blending and loading.

Average pit production is more than 3,500 tpd, in raw coal at the plant hopper. This tonnage comes from the Illinois Nos. 2 and 3 seams. The No. 2 seam is 4 ft thick, overlain by the 18-20-ft band of rock. Above is the 3½-ft No. 3 seam, overlain by cover that ranges from 15 to 50 ft in thickness. In one place total cover, including the band between the seams, was 100 ft thick. Cover on the upper seam is horizontally drilled and the band between the seams is drilled vertically in preparing the overburden for stripping.

Saxton Coal Corp., headed by Ken-



NEW 10-YD DRAGLINE, reportedly the largest unit on single crawlers, is powered by two diesel engines. Higher line speeds in hoist and drag motions and faster propel lead to higher efficiency in stripping band between two seams.

neth Youngs, president; Bernard Youngs, vice president, and Darwin Youngs, general manager, has been operating in the mid-western coal fields since 1941. The company has produced from properties in Kentucky, Tennessee, Indiana and Illinois. Exclusive sales agency for the coal produced at Walnut Grove mine is the Sterling-Midland Coal Co., Chicago, Ill., and Saxton's officials report that since the beginning of operations in Illinois in 1953 the company has not lost a single loading day because of the lack of orders. First coal was loaded at Walnut Grove in August, 1956.

#### Preparing the Coal

The cleaning plant at Walnut Grove was designed by McNally-Pittsburg to provide a simplified structure employing a minimum of steel. The result is a plant that is low in height and built alongside the loading tracks, not over them. The height of the plant is only sufficient to house the washbox with a drag tank underneath at ground level. Primary crushing is done at the truck hopper and raw coal is carried from the crusher to the top of the plant on a 42-in belt conveyor. Clean coal is conveyed from the plant to a loading tower over the tracks on a pair of belt conveyors.

The flow in preparation is as follows:

Haulage trucks from the pits dump into a 75-ton plant feed hopper which provides two approaches for the trucks to eliminate waiting. Raw coal is withdrawn over a 4x8-ft reciprocating feeder which discharges into a 36x54-in single-roll crusher set to produce a top size of 4 in. The crusher product is carried on the 42-in feed belt to the top of the circuit in the plant.

Minus 4-in raw coal is discharged directly into the 6-cell McNally-Norton jig. Clean coal is passed over two double-deck Allis-Chalmers Low-Head dewatering screens on which separations are made at 1-in on the top decks and at ¼ in on the bottom decks. The overproducts of the two decks can be loaded directly or blended, or the plus 1-in clean coal can be crushed in a 36x60-in McNally-Pittsburg Gearmatic crusher.

The 4x0 underflow of the dewatering screens is sluiced into a drag tank at ground level. The fines are pumped by a 6x8-in McNally-Pittsburg pump to a 6x12-ft Low-Head desliming screen where freshwater sprays remove the minus 28M material. The 4-in x 28M fine coal from the desliming screen feeds two McNally-Pittsburg Dryclones, each rated at 50 tph. Feed to the Dryclones averages 14% moisture and the

product averages 7% moisture. The product is directly discharged from the Dryclones onto either or both of the 36-in loading belts. The loading combinations appear on the flowsheet.

Only two sizes are loaded at one time, but size specifications may be changed readily through the use of a system of swing gates in the chutes which feed the loading belts. The connected electrical load for preparation totals 750 hp.

The plant is served by the New York Central railroad. Cars are loaded in reverse of normal practice with storage of empty cars ahead of the loading tower and storage of loads beyond it. This arrangement was selected by Saxton officials to eliminate a major grading operation that would have been required if trips of empty cars were to be pushed through the loading tower and loaded on the way out. The need for making a high fill to permit gravity handling of the empty cars, as in normal practice, was eliminated by laying the track on the natural grade and loading in reverse.

Two fresh-water ponds constructed by the company provide a reservoir of 16,000,000 gal of process water. Plant wastes in the fine sizes are pumped to a settling area from which clarified water filters back into the fresh water ponds for recirculation through the plant.





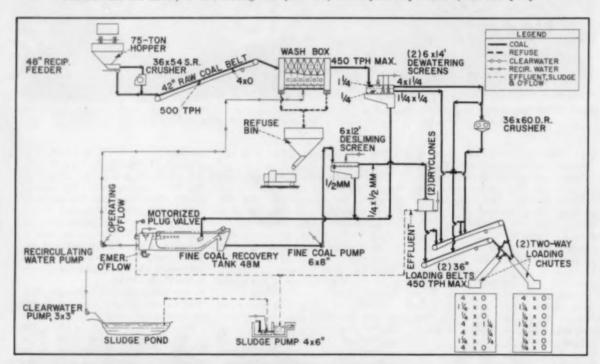


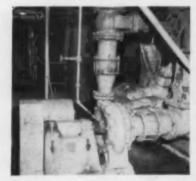
Feed . . .

Wash . .

Load . .

RAW COAL from 75-ton hopper is crushed to minus 4 in, conveyed directly to 6-cell washbox. Clean coal is screened on vibrators and fed directly to two loading conveyors. Only lift in plant is provided by fine-coal pump.









Pump . . .

Deslime . . .

Dewater . . .

MINUS ¼-in FINE COAL, collected in drag tank, is pumped from ground level to desliming screen. ¼-in x 28M product of screen is chuted into two centrifugal machines and dried fines are then chuted onto loading conveyors.

#### Stripping Two Seams

The property is being worked from the north and south ends back toward the plant, which is centrally located. Stripping in the south is done by a Marion 7400 walking dragline swinging a 13½-cu yd bucket. The 7400, which strips cover from both seams as they are exposed, operates from a bench on the cover over the top seam without a need for ramps or other special arrangements to strip the band between the seams.

Stripping in the north is done by a Lima 2400 (7½-cu yd bucket) and a new Marion 183-M equipped with a 10-yd bucket. The 183-M is a crawler-mounted dragline, powered by a pair of Caterpillar diesel engines. The machine is the outgrowth of cooperative planning by Saxton officials and Marion Power Shovel Co. and Caterpillar engineers.

In looking ahead to the type of work the new unit would have to do, Saxton's operating chiefs saw a need for faster line speeds in the hoist and drag motions and faster propel. The faster drag and hoist are primarily required in removing the 20 ft of rock between the seams. When this stage of the operation is reached, the spoil from upper-seam stripping already has been stacked in the pit. The material overlying the bottom seam must be hoisted above and dumped on top of or beyond this initial spoil. Thus a faster cycle is required to maintain stripping yardage at a reasonable rate since every bucketful must be hoisted clear out of the pit. The boom is 130 ft long.

The drag rope diameter is 1% in and the hoist rope 1% in. Crawlers are 30 ft long and 66 in wide. The faster propel speed makes it possible for the machine to move about quickly in working the two seams.

The hoist, drag and propel motions are powered by a turbocharged V-12 Caterpillar D-397 diesel engine. The swing motion is electrically powered from a generator which is driven by a D-337 engine. This second engine also drives the cooling fan and air compressor, relieving the larger engine of all auxiliary duties. The 183-M is reportedly the largest machine on single crawlers.

The upper seam, the 3½-ft No. 3, is stripped and loaded out, the rock interval between seams is drilled and shot, then the lower seam is exposed and loaded out. Cuts are 50 ft wide, and the removal of the bottom seam presents a full highwall with a clear pit alongside to receive spoil from above the upper seam.

(Continued on page 79)



PAIR OF DOUBLE-DECK SCREENS receive clean coal from washbox to produce 4x1¼ and 1¼x¼ overproducts for subsequent loading on crushing and blending.

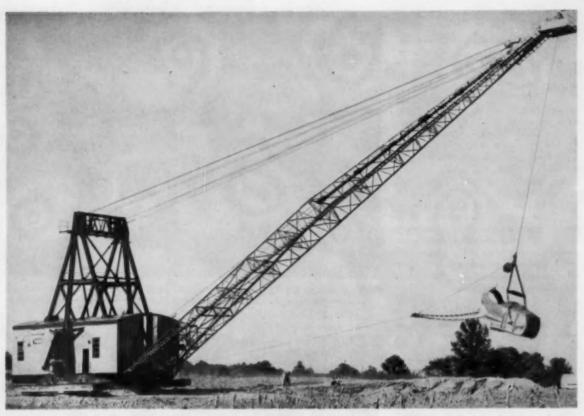


CLEANING with high-capacity vacuum unit and frequent washing-down make a dust-free plant and contribute to better plant maintenance.



COMPANY-MADE DAMS impound 16 million gal of process water for plant use.

Reject slurry is decanted in settling pond and clear water is reused.



MAJOR STRIPPING MACHINE is this 13½-yd electric walking dragline which strips both seams from highwall position.

This machine has been the "workhorse" at other Saxton properties, particularly in Indiana.

#### Three draglines remove up to 70 ft of total cover



FASTER HOISTING with new 10-yd machine is required for high-and-wide disposal of rock parting between the seams.



DIESEL DRAGLINE with 7½-yd bucket removes rock interval between seams after top seam has been loaded.

#### Preparing Overburden

As previously mentioned, the cover above the upper seam is drilled horizontally and the band between the seams is drilled vertically. The horizontal drill is a Parmanco unit using 6%-in bits, and the vertical drill is a Reich unit using 6%-in bits.

Blastholes in the upper cover are drilled 18 ft apart to a length of 50 ft. Breakage and dislodgment at the back of the cut permit removal of sufficient overburden to provide the 50-ft width of cut. In some areas of thicker cover a hard sandstone strata shows up in the cover above the upper seam, which requires that holes be drilled higher in the bank to concentrate a portion of the charge near the hard layer. At such times, a shop made horizontal drill is mounted on top of the water tank on the road-sprinkling truck and the drilling is done from that platform. Four bolts secure the drill to the tank.

The Reich truck-mounted vertical drill is operated by one man to provide blastholes in the rock band between the seams. The mast of the unit is high enough to accommodate a 20-ft-long drill rod, making it possible to drill the band without changes of steel. Ordinarily, both drills operate from the top of the rock between the seams, with the horizontal unit working one cut ahead of the vertical drill.

Overburden usually is broken by using high Olin Mathieson explosives in 6-in-diameter cartridges with detonating fuse. A decked charge is used in the vertical holes to insure breakage in a hard layer high up in the band. However, at the time the new Saxton property was visited by the writer, company officials and representatives of the Atlas Powder Co. were engaged in a series of test shots using the new Atlas ammonium nitrate granules.

Atlas Granules are ammonium nitrate in solid, cube-like form. Particle size is from 5 to 20 mesh, and the material is specially coated to condition it against moisture pickup and caking.

At Walnut Grove, the granules were poured directly from 80-lb shipping bags into wet holes, after a gallon of fuel oil had been poured into each bag and allowed to set for a time. In some instances the loose granules were in the wet holes for periods ranging from 1 to 4 hr without adverse effect. The Atlas blasting engineers suggest that in preparing charges with this high-density ammonium nitrate a priming core should extend continuously through



HORIZONTAL DRILL prepares blastholes in top-seam cover and vertical drill sinks holes in rock between seams without drill stem changes.



TEST SHOT with high-density ammonium nitrate granules produced good fragmentation from coated explosive poured loose into wet holes.



ELECTRIC LOADING SHOVEL is teamed with diesel-powered dragline to eliminate cable conflict as machines pass each other in operation.



WELL-CONSTRUCTED ACCESS ROADS and ramps to loading sites in both seams reduce haulage delays and contribute to truck-maintenance economy.



FRONT AND SIDE of plant feed hopper provide dumping approaches for trucks to eliminate waiting time and excessive maneuvering.

the wet part of the hole, that good confinement should be provided and that strict supervision should be exercised to achieve best results.

The primer used at Walnut Grove is a 4-in, 12½-lb cartridge of high-velocity gelatin with a Rockmaster blasting cap for detonation. The primer is placed at the bottom of the hole and the granules are poured in to fill the hole completely. The priming core is made of 2-in, 5-lb high-velocity gelatin, sleeve connected to make the core continuous throughout.

The bottom charge in each hole contained 80 lb of the granules with the primer charge. The holes were stemmed to within 9 ft of the top where a deck charge of 40 lb of granules and another primer were placed to break the hard layer. Additional stemming to the top of the holes completes the preparation. The holes are drilled on an 18x16-ft pattern with MS delays between rows.

Good fragmentation resulted, the broken material lending itself to removal by the draglines without trouble. Blasting ratio at Walnut Grove is normally 4 cu yd of broken rock per pound of explosive.

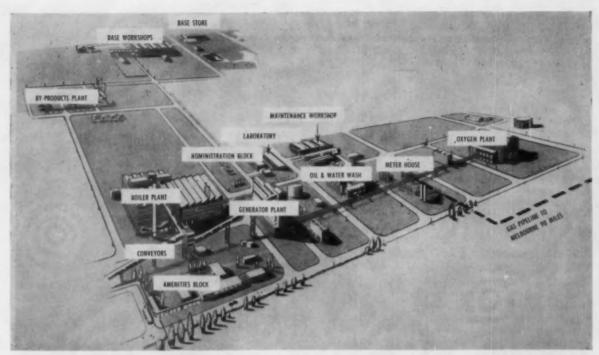
#### Loading and Haulage

The walking dragline in the south pit is powered by a 4,160-v electrical system while the 183-M and the Lima 2400 are diesel-powered units. Two loading shovels are in use, a Bucyrus-Erie 54B (electric) in the north pit and a Northwest 80D (diesel) in the south. Thus an electric loader is coupled with a diesel-powered stripping unit and vice versa to eliminate cable conflicts as the units pass each other.

Both loading shovels are equipped with Esco coal-loading buckets, 4½-yd on the 54B and 4-yd on the 80D. The coal-haulage fleet consists of seven International trucks, two 14 ton RF-212's and five 18-ton VF-214's. These are dispatched to either of the two shovels according to length of haul distances and the prevailing loading schedules.

Carefully graded ramps are provided to loading sites in both seams, and all roads are shaped up by an Allis-Chalmers grader. Tops of the exposed seams are cleaned by a Hough Payloader prior to loading. Heavy grading and earthmoving are done by Caterpillar D-7 and D-8 bulldozers.

Total employment at Walnut Grove is 80 men for three-shift stripping and single-shift loading and cleaning of the coal.



GAS AND FUEL CORP. OF VICTORIA puts brown-coal gasificaton works on stream in southeast Australia. Two other similar plants in Central Europe make this the world's third producing . . .

### Commercial Gas from Brown Coal

A huge supply of native, low-cost brown coal, backed up by progress in its use, is pointing southeast Australia toward independence of black coal imports in making gas. Brown coal is already an important source of power generation; future plans call for using it to produce metallurgical coke and liquid fuels.



DR. R. S. ANDREWS (right), chairman and managing director, Gas & Fuel Corp. of Victoria, conducts H. R. H. the Duke of Edinburgh around the new Morwell gasification plant.

GOOD-QUALITY GAS made from brown-coal briquettes is now being piped 103 mi in southeast Australia, from the brown-coal mining area in the Latrobe Valley to metropolitan Melbourne. When brown-coal gasification swings into full production, fear of gas-rationing in Victoria and dependence on imports of high-grade black coal from New South Wales will be virtually eliminated. Furthermore, a new major industry with wide ramifications will develop.

The brown coal gas is being produced by the Lurgi high-pressure gasification process at the Morwell plant of the Gas & Fuel Corp. of Victoria. The gasification works are part of the Morwell Power & Fuel Project which has been under study and development for the past 15 yr by the Victoria Government and its State Electricity Commission. The total project also includes upgrading

brown coal into briquettes for making electric power and metallurgical coke, and envisages synthetic-liquid-fuel production from brown-coal gas.

Although some parts of the Morwell gasification plant are undergoing adjustments and minor modifications required by the nature of brown-coal briquettes, it is virtually completed. Trial runs were conducted in October, 1956, and gas first entered the pipeline for Melbourne on Nov. 29.

#### Planned Capacity

Morwell's initial gas output has been programmed at 15 million cu ft per day. This will be produced from six Lurgi generators with ancillary plant, and two oxygen-pro-

Adapted from an article by Dr. R. S. Andrews, chairman, Gas & Fuel Corp. of Victoria, published in the Mining and Geological Journal.

ducing units which, if worked simultaneously, will liquefy 1,000,000 cu ft of air per hr. From the gas will be recovered 300,000 gallons of high-octane motor fuel and 1,000,000 gallons of brown-coal tar per year.

Output will be doubled in 1959 when briquettes are available from the new briquette factory of the State Electricity Commission at Morwell. It is further planned to quadruple the output by 1965, which would make the Gas & Fuel Corp. of Victoria independent of coal supplies from New South Wales. Gas requirements for metropolitan Melbourne currently exceed 40 million cu ft per day.

#### Pipeline Transport

Since the gas is produced under a pressure of 450 lb, no pumping is required. It goes to Melbourne under its own pressure through an 18-in steel-welded pipe line. At Dandenong (about 20 mi from Melbourne), a control station reduces pressure to 25 lb and the gas flows to West Melbourne and the Highett Works for enrichment with other gases, notably oil refinery gas. At some future date, gas will be pumped to principal country areas in Victoria.

The laying of the 103 mi of 18-in pipeline from Morwell to Melbourne was a unique venture in Australia. After several 30-ft lengths of pipe were welded together on the surface they were lowered by side-boom loaders into a 5-ft trench and then welded to pipeline sections already laid. Up to 15 30-ft lengths of welded pipe were lowered in one operation in this manner. With pipe-laying at the rate of 2 mi per week or better, the pipeline was completed in August, 1956, 2 mo ahead of schedule.

#### Gasifying Brown Coal

Advantages Outweigh Disadvantages—In considering the gasification of brown coal, the major problem was the very nature of the brown coal itself. Brown coal has different characteristics than black coal. The two materials are not interchangeable in the same equipment for gasmaking.

Brown coal or lignite is geologically much younger than black coal. In its natural state, Victorian brown coal contains between 50 and 66% moisture and its calorific value is between 5,600 and 3,690 Btu per lb, respectively, compared with about 4% moisture and 13,000 Btu per lb for the average gas-making



OIL AND WATER wash towers remove carbon dioxide and other impurities from crude hot gas. After drying, pure gas then goes into pipeline under its own pressure.

black coal from New South Wales.

Brown coal has its intrinsic disadvantages. But it also has natural advantages, including low ash content (proximate analysis, dry basis, 3.1%), and almost unlimited supply available by relatively easy strip mining. These advantages have combined with rapid technical and scientific progress in utilization to make brown coal more practical than black coal in Victoria.

Carbonization Uneconomical— Throughout the world at the present time, gas is manufactured principally by carbonization. Using this technique, externally heated retorts dissociate coal thermally, giving rise to the formation of gas, tar and ammonia, and leaving coke behind as a residue.

When brown coal or briquettes are treated in this manner, the gas yield is small and its heating value is low. Furthermore, such gas contains 30% carbon dioxide and the coal does not form a coke but a highly reactive

char, like charcoal. Since this char ignites spontaneously at the slightest provocation, it is difficult to handle and practically impossible to market. Thus, the normal carbonization process is entirely uneconomical when brown coal is used.

Water Gas Give Clue—In modern gas practice, the carbonization of coal is usually accompanied by the production of water gas to meet peak loads and fluctuating demands. Water gas is produced by the passing of blasts of air and steam alternately through an incandescent bed of coke. When steam passes through the fuel bed it is decomposed and water gas is formed by the mixture of two gases, carbon dioxide and hydrogen. The heating value of this gas is too low for town-supply purposes and it has to be enriched with oil gas.

If brown-coal briquettes are used in a water-gas plant, they break up under the velocity of the air blast and render operations uneconomical. Although such behavior makes stand-



LAYING of the 103-mi 18-in pipe line from Morwell to Melbourne was a unique venture in Australia. Up to 15 30-ft lengths of welded pipe were lowered into a 5-ft trench in one operation.

ard water-gas plants impractical for brown-coal gasification, the principles involved form the basis on which the ultimate plant was evolved.

The Lurgi Process—During the middle 1930's, Professor Drawe, Technical University, Berlin-Charlotenburg, and his assistant, Dr. Danulat, Lurgi Co., were working on steam-oxygen gasification. Their calculations showed that if gas was produced by this method under a pressure of 300 lb the resultant gas also contained 20% methane, rendering it rich enough for town consumption. Two large plants incorporating the process were erected in Central Europe, one at Böhlen in 1940 and the other at Brüx in 1943.

In developing this process which has been adopted at Morwell, Victoria, the Lurgi Co. has created a method of gasifying all coals, both black and brown, which do not form a coke. These coals constitute the bulk of not only Australia's but also the world's untapped reserves.

#### Coming Developments

Future plans call for two major developments:

1. Production of hard coke from brown-coal briquettes.

2. Synthetic-liquid-fuel production from brown-coal gas.

Hard Coke Production—A pilot plant for the manufacture of metallurgical coke will be ready for testing late this year. It will produce 25 tons of coke per day—enough for testing its quality in full-scale matallurgical operations. If results are successful, a large-scale commerical plant will follow.

The conversion of brown coal briquettes into hard coke is based on the Spühlgas Process. In this method Spühlgas, or rinsing gas, at temperatures around 700 C, is passed through the briquettes. In other words, the briquettes are coked by direct heat instead of indirect heat. Under these conditions, they shrink to less than half their original size, forming a dense coke. By carefully controlled heat treatment, Professor H. K. Worner, Melbourne University, has succeeded in producing this type of dense brown coal coke, or hard char, from ordinary extrusion briquettes made at Yallourn (nearby Morwell in the Latrobe Valley).

The Gas & Fuel Corp. is spending £80,000 on the development of this modified process to produce hard coke for metallurgical purposes and for use in slow combustion stoves.

Synthetic-Liquid-Fuel Production— Plans are also in hand to combine synthetic-liquid-fuel production with the manufacture of gas, By this method, carbon monoxide and hydrogen are converted to liquid fuel, and the other constituent of the gas, methane, which is a rich gas, remains unaffected. About one-third of the heat units in the gas is converted to liquid fuel and two-thirds remain as a rich gas for domestic and industrial consumption.

This method has the disadvantage of tieing liquid-fuel production largely to the amount of gas consumed. On the other hand, gas production accounts for 70% of the cost of liquid-fuel products. Thus by combining gas and synthetic-liquid-fuel manufacture, the expensive gas-making plant is already provided for. This factor makes the process economically attractive in Australia.

The aim, of course, is not merely to produce oil and gasoline. Except for three winter months, the majority of gas undertakings have a part of their plant lying idle. During this period, gas-making units could be swung over to oil and gasoline production, thus using idle plant and capital and further reducing the price of gas to the consumer.

It is hoped to have the first synthesis unit operating in 1960. From then until 1976, production will be expanded to about 60 million gal of liquid products per year, of which 27 million gal will be gasoline.



ROPE-BELT was selected for intermediate haulage since it conformed more to mining methods and conditions than other types. Belt affords the shortest shuttle car haul and provides 3 separate approaches for discharging its load.

### Designing A Haulage System

Here's how Humphrey No. 7 analyzed its haulage problems and why it selected shuttle cars, rope-belt conveyors and large capacity mine cars for its three-phase haulage system.

By W. N. Poundstone Superintendent Humphrey No. 7 Mine Christopher Coal Co.

SELECTION of a haulage system for any operation, I feel, involves three major considerations. First, the job it must perform, i.e., the amount of material to be hauled, the distance it must move, and the peaks in capacity that must be handled. Second, the natural conditions that affect the haulage system. Third, the type of men that will be engaged in the job of operating and maintaining the system.

Failure to consider any of these items could well cause the selection of a poor system. A mistake often made is for someone to buy a piece of equipment that he saw doing a

good job at another operation, under different conditions and performing an entirely different function.

In the case of Humphrey No. 7 mine of the Christopher Coal Co., a haulage system was needed to transport about 12,000 tpd a distance of 4 to 15 mi. This coal is produced by ripper-type continuous miners. Because of quality control, the production will come from widely scattered areas. Therefore, the system must be flexible enough to permit frequent shifts of production equipment. This again is dictated by quality control, since changes in sections must be made to offset variations in analysis of the coal.

#### **Humphrey Conditions**

The natural conditions at the Humphrey property are as follows:

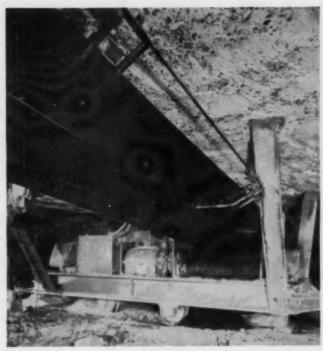
- 1. Pittsburgh seam coal with a mining height of 6½ to 7½ ft.
- 2. A very gaseous seam.
- 3. Very uneven bottom with many
- 4. Grades against loads, especially severe in one area of the property.
  - 5. Many gas wells.
- Generally good top. However, some very bad "snap top" is found in certain areas.

Each of these conditions had a strong bearing on the selection of our haulage system. In discussing the selection of the equipment, I would like to start at the face and work toward the outside, explaining in each case how we arrived at our selection by listing the various options that were considered and our reasons for the choice. Then, I will discuss modifications that were made to fit the equipment to our particular job.

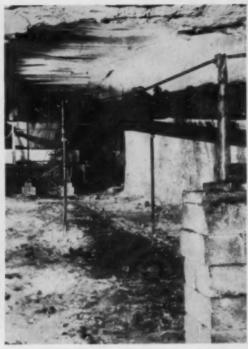
#### Face Haulage

The face end of the haulage system is by far the most difficult because

Abstracted from a paper presented at the 1957 apring meeting of the West Virginia Mining Institute.



DRIVE UNIT mounted on a truck is anchored in position in tracked crosscut. Unit can be moved in less time.



ELEVATED head pulley discharges into 16-ton mine cars. Automatic controls prevent spillage between cars.

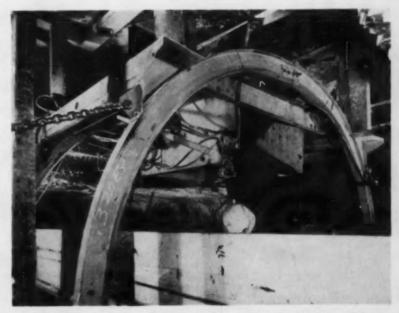
the working face is constantly moving. This means that the transportation must not only be capable of moving material at the required rate, but must also lend itself to ready extension as the face advances. To achieve this, there are several devices available. The ones that were considered were:

- 1. Belt or chain-direct loading.
- Bridge conveyor to a belt or chain conveyor.
  - 3. An articulated conveyor.
  - 4. Shuttle car.

The shuttle car was selected as the first link of our haulage system for the following reasons:

1. I feel that indirectly gas was the principal factor in this choice. The only way we know of handling large amounts of gas is to dilute it with a sufficient quantity of air. This requires large cross sectional areas in our airways which includes multiple headings. For additional safety, we use split ventilation on our development sections. This necessitates additional headings. The result is that our development work consists of about seven or more headings to the section.

To use a direct conveyor haulage or even a bridge conveyor with this type of device would mean conveyors



LIGHTWEIGHT knockdown arch structure supports the head pulley and flygate chute in position above the mine cars. Drive unit is 80 ft back of the belt pulley.

for each of seven or more headings. There are two good reasons why we felt this was impractical: (A) there would be an enormous capital investment in conveyors and (B) only one conveyor could be used at a time.

2. Bad top also had an influence on selecting the shuttle car. In very adverse roof conditions it sometimes is impractical to attempt to hold the top in all places. The shuttle car is flexible enough to allow coal to be moved in a variety of different paths, as dictated by falls and posted areas.

 The many gas wells making the mining operation impractical if only straight-line devices (conveyors) are used.

These were the reasons why we chose the shuttle car over a straightline conveyor. An articulated conveyor used in connection with a straight-line conveyor could possibly do the job without the above objections. However, it is inherently less flexible than a shuttle car and is more practical in as short a length as possible. They do have one inherent advantage over the shuttle car and that is practically unlimited capacity. There is a definite limit to the number of tons per minute that can be handled with shuttle cars. The capacity of a shuttle car is tied directly to the height of the seam. However, our studies show that in our high coal the continuous mining equipment has not reached an output rate in excess of a good shuttle car haulage system. With this thought in mind, we felt that the additional flexibility of the shuttle car was worth more than additional capacity.

#### Improving Shuttle-Car Cycle

After the shuttle car was selected, we studied the problem to see if there was any practical way of increasing its capacity. Basically, the capacity of this type of system, or the tonnage that can be hauled in a given time, is equal to the number of trips (or number of cars hauled) multiplied by the number of tons per trip. The latter item is fixed by seam height and width of the working place. We felt that a practical limit had been reached in this respect. Therefore, it appeared that any increase in capacity would have to come from increasing the number of trips hauled. A shuttle car trip consists of four steps:

- 1. Receive load.
- 2. Tram to discharge point.
- 3. Discharge load.
- 4. Tram back to loading point.

A reduction of time required for any or all of these steps would result in more trips, which in turn would result in added capacity. Actually, we found that each of these steps could be improved. Speeded up loading machines equipped with paddles in place of loading arms are used to reduce the time required to fill the shuttle car. It loads from a surge pile on the mine floor behind the continuous miner. Shuttle cars with as fast an unloading rate as practical are used to increase the discharge rate.

Next the problem of reducing the two tramming times was tackled. Here, we reasoned that this time is equal to the distance traveled divided by the average speed of the car. This meant that we had to reduce the distance traveled or increase the speed. An engineering study of the cars revealed that to increase the speed would mean larger motors and larger gearing and this would further reduce pay load in the car.

The distance traveled seemed to be the item that offered the most hope towards an increase in capacity. As I mentioned previously, the width of the working section is determined by our ventilating needs, so there is a more or less fixed distance that the car can haul across the section. It became apparent that we should use the shuttle car to move coal from the moving face to an unloading point that is located in the center of the section (to balance the haulage distance to either side) and as close as possible to the face.

#### Intermediate Haulage

The next step in the haulage system is to select a unit to receive the discharge of the shuttle car (at a point that is as close as possible to the face of the section) and move it either all or part of the way to the outside. There were two means considered:

- Load into mine cars by the use of track loops.
  - 2. Transfer to a belt conveyor.
- A 36-in rope-belt conveyor was selected for the job. There were many reasons for this selection, as follows:
- 1. The belt conveyor offered us the shortest shuttle car haul. This is achieved by extending the belt every block (80 ft) and placing the tail piece at the intersection of the center heading one block back of the last crosscut. Thus, the shuttle car haul to the belt is at all times as short as the track loop haul. It is impractical to move a track loop every block.
- 2. The belt tail piece has three separate approaches, which means that shuttle cars do not have to wait to switch in and out of the ramp heading. In the event of a cable failure at the unloading point only one buggy is shut down since there are two more dumping points available for other
- Considerably less time and labor are required to extend the belt even considering the fact that the belt is extended in shorter increments.
- 4. The backlashing of cables is eliminated since each shuttle car cable is anchored at its dumping point. In

our operation this has almost doubled cable life.

- 5. Car moving equipment is only moved every 2,000 ft instead of every 2 or 3 blocks.
- The belt lends itself to automatic loading since it remains fixed for a longer time.
- 7. Mine car haulage is simpler since motormen are not constantly changing the pick-up point for loaded
- 8. The use of belt for development work allows time to do a much better first-installation job on track. Since this track is not needed immediately as the section advances, more time is available to do grading and ballasting work.

After the decision was made to use a belt conveyor, we again looked to see what type was best suited to our job. With this unit, capacity was not a problem since it is a function of belt width and belt speed. Therefore, we were more interested in a conveyor that could be quickly extended with a minimum of labor. Since our sections could advance the 2,000 ft in as little as 2 mo, we needed a conveyor that could be recovered and reinstalled quickly and easily. Also, we wanted a conveyor that could be lined and leveled as easily as possible, because our rolly seam condition makes this work quite a problem.

#### **Belt Modifications**

After considerable thought, we decided that a modified rope belt best suited our needs. The modifications that were made and reasons for these changes are as follows:

- 1. The top idler spacing was extended to 8 ft. This was found to be satisfactory by tests. It resulted in fewer parts needed for a "move-up" which in turn reduced the time required for this job. It also resulted in a substantially lower initial cost.
- 2. The rope support stands, and return idlers were extended to 32 ft. This meant that only 2 or 3 stands are required for an 80-ft extension. It also meant fewer points to line and level.
- 3. We developed a means of using a continuous rope instead of adding a short length for each extension. This was accomplished by lacing the rope through a sheave on the tail piece and having a spool of wire rope mounted near the drive. The rope is anchored at the tail piece and the slack end lies on the ground back to the spool. At the time of the moveup the anchor is released and the rope is pulled into the system around the sheave (from the spool) by the tail

piece as the belt is pulled in place.

4. The conveyor drive and flygate chute were designed so they could be moved and installed more easily. It had been our practice to set the conveyor drive on top of about a 5-ft-high crib so the head pulley would be high enough to discharge into a flygate chute over the mine cars. This has always been a difficult job because the drive is too heavy for a cutting machine to lift. The job of mounting the flygate chute has also been difficult because it could not be mounted until the drive was set, hung from roof bolts and then braced to make it solid.

To reduce labor and time on these jobs the following changes were made:

 The drive was built on a flangedwheel frame so it could be moved into position on the track without having to load and unload from a carrier.

The head pulley was removed from the drive and, in effect, mounted on the flygate chute in the proper position to insure proper trajectory and a minimum of spillage.

 A lightweight knockdown arch structure was built to support the head pulley and flygate chute in the proper position above the mine car.

4. The drive was placed on the ground beneath the rope pan line one block back of the track loop, putting it 80 ft away from the head pulley.

With these changes we have been able to greatly reduce the time and labor necessary to recover, transport and install a conveyor without the expense of self-tramming drives and tails that would be vastly more expensive for the size and length of conveyor we are using.

#### Final Phase

We have now transported the coal from the face to a fixed point 2,000 ft away. While this represents only a small fraction of the overall distance, it is by far the most difficult part of the job. From here out we have the options of:

- 1. Going the rest of the distance with belts.
- 2. Transferring to another belt and then into mine cars.
- Loading into n ine cars at this point.

We decided to use mine car haulage and to transfer the coal into the car directly from the section belt. Our reasons for this decision were as follows:

1. Capital investment was the lowest for the long distance involved. 2. Track haulage lent itself better to work that could not be concentrated for quality reasons.

3. Track offered more flexibility in the rapid changes of sections and equipment. If we pull out of a section because of quality, the track can be left without a great investment in idle equipment while belt cannot.

4. The transportation of men and supplies over an area as vast as this property requires good track. Therefore, if belt was used there would be a duplication of facilities.

5. The mine car system has an inherent surge capacity not found in belt haulage.

Mine cars offered a better opportunity of blending inside by means of switching and saving cars containing a certain quality coal.

The gas wells made it impractical to mine in straight lines in certain areas.

There was one good argument in favor of belts—that being the rather severe grades that were present, especially in one area. However, we felt that we could use the one belt link in our overall haulage system to provide us with the time required to make the cuts and fills necessary to build reasonable grades on our haulage tracks.

#### Mine Car Capacity

Again the mine car was studied to see what could be done to increase capacity. Like the shuttle car the amount of coal hauled is a product of the number of cars hauled times the tons per car. Capacity could be increased by hauling more cars or by having more coal in each car. One study showed that the number of cars hauled in a given trip depends upon:

- 1. Grade.
- 2. Size of the locomotive.
- Speed and horsepower of the locomotive.

The overall grade is fixed by the seam and even though we make severe cuts and fills it does not change. The size of the locomotive could be increased, but additional weight must be accompanied with increased horse-power to be useful. We felt that the 50-ton locomotive now in use was about the practical limit in this respect because of power-transmission and current-collection problems.

This leaves us with only the matter of live load to dead load ratio in the mine cars if we are to make an improvement over existing equipment. In other words, if we are to gain capacity in a given trip, we will have to use the pulling power of the locomotive to move as much coal and as little mine car as possible.

A large mine car looked like the best approach to this problem. Actually, the height and width of the car are pretty well limited by the seam height and mining practice. This left us with only the car length as a possible source of increased capacity. An investigation of mine cars from 18 to 36 ft in length was made on the basis of cubic feet of capacity per pound of car weight and per dollar. It was surprising to find that while the larger cars showed some cost advantage for a given capacity, the live load to dead load ratio did not change as greatly as expected. In fact the wheel size and wheel base had about as much effect on the capacity as the car length.

In the final selection, we decided on larger wheels and a longer wheel base to improve car maintenance. Our study did show that there was a slight gain in capacity up to about a 28-ft car. Beyond this length the additional structure to support the span prevented further advantage. Therefore a 28-ft car was selected. This car holds about 16 tons of material. There are several other advantages.

1. Fewer wheels and couplers to

2. Lower initial cost per unit of capacity.

3. Slightly reduced trip length.

4. Less flygate chute operation.

On the other hand the long cars do impose some problems. First, they hang over on a curve about a foot further than a 10-ton car. Second, they require better track with longer radius curves. For instance, our cars will not operate on anything sharper than a No. 3 switch. Third, we must drive a radius for each track loop.

At first glance these items seem to be very serious handicaps. However, we feel that these so-called handicaps have been an advantage in the overall picture. We used to lay poor track because perfect track was not necessary for the smaller cars. We now have fewer derailments as a result of laying better track. We formerly did not drive a radius curve for a track loop. However, I feel that it costs less to drive the radius at the proper time in the mining cycle than it did to take a cutting machine back to round a corner or to make clearance. We also feel that having good track and big radius curves has helped considerably in the job of moving coal at higher speeds and transporting supplies and equipment in and out of the working sections.



MECHANICAL TAMPING eliminates nearly all physical work in charging 60-ft blastholes, three holes in 25 min.



SELF PROPELLED unit is maneuvered into position in front of hole. Tamping rod is spooled on square reel by torque motor.

### Mechanical Tamping of Blastholes

New machine loads and tamps horizontal 6-in blastholes at Energy mine, Peabody Coal Co.

MECHANICAL LOADING AND TAMPING of blastholes and greater flexibility in mining operations are top gains marked up by a combination loading-tamping machine at Peabody Coal's Energy mine, Herrin, Ill. One man in four days, single shift, does what it took two men five and six days to do. And he does it easier.

Flexibility in pit operations is another tangible benefit of the load-tamp machine. For example, blast-holes now can be loaded after the seam is taken out up to the highwall. Since blastholes are drilled 2 ft above the 3½-ft coal seam, it was necessary to leave a coal berm when holes were charged by hand.

The unit at Energy is the first commercial version of a machine developed at Peabody's Tecumseh mine several years ago. Sanders Payne, then superintendent at Tecumseh and now at another Peabody mine, supervised the construction of the first machine at the Tecumseh mine. He conceived the idea for the machine and then directed the assembly work. If the machine proved successful, he knew that time and money could be saved for the company.

An old Sullivan sidewall drill was stripped down and used as a chassis. The various components of the loading and tamping mechanism then were fabricated and fitted on the chassis. This pilot model was used for a period of 18 mo at Tecumseh mine. Results were so outstanding that the company decided to have a commercial model built for use at the Energy mine. The commercial model is called the Payne Load-Tamp and is sold by the Explosives Div., Olin Mathieson Chemical Corp.

#### How It Works

The principle of operation of the machine is that a jointed tamping pole, made up of 6-ft sections, is pushed in and pulled out of the blasthole by friction. The pole is stored around a special square reel. Specially designed joints lock together when the pole is in compression while pushing explosives or stemming into the hole. Thus the necessary rigidity is provided. As force is applied to pull the pole out of the hole, the locked joints are pulled apart and the connections are free to bend.

Friction to feed or retract is provided by two pairs of rubber-tired wheels. Each wheel is driven independently. Friction against the pole can be increased or decreased by an adjustable spring-tension system on the rubber-tired wheels. More fric-

tion is needed when loading a dirty hole or when the tamping pole becomes slippery with mud and water.

The square pole-storage reel is not power driven. Instead it normally keeps the pole in the wound-up position by means of a cable and drum arrangement operated by a torque motor. The effect of the torque motor is easily overcome by the friction drive on the instroke.

The reel has storage capacity for 13 sections of aluminum pole, making a total length of 72 ft. Since a small portion of the pole cannot be used, the effective depth to which the machine can be used is 65 ft. As the reel winds or unwinds it is indexed laterally so that the pole is in alignment with the hole on the instroke and the wrapping alignment is correct on the outstroke.

After the machine is aligned with the hole, the only work required of the shooter is to place in the collar of the hole the quantity of explosives or the number of tamping bags to be pushed in the hole in a single stroke. After tamping bags are pushed in the hole, considerable swelling and packing takes place before resistance is created to cause the friction-drive rollers to slip. Although the machine cannot duplicate the solid packing of hand tamping, the company says that the machine applies enough direct pressure to swell the tamping bags enough to produce very satisfactory confinement.



CONVENIENT CONTROLS at tamping head permit exact control and minimize lost motion and time of operator.



PLENTY OF REACH is built into machine. Hydraulically operated mast raises tamping mechanism to height of 7 ft 8 in.

#### Machine Design

All components of the machine are powered by 440-v electric motors except the mast. This is raised and lowered by a hydraulic jack. One 25-hp General Electric motor powers the hydraulic system for raising and lowering the mast and also drives the crawlers. The rod reel is driven through a Dorris speed reducer by a General Electric 4.5-ft-lb torque motor. A Wagner 3-hp motor, transmitting power through a Falk reducer, drives the four rubber rollers that feed the tamping pole into the hole.

The control switch for feeding or retracting the pole is located at the tamping head to permit exact control. This location also permits the operator to charge the hole and operate the machine with a minimum

of lost motion and time. Adjustments for the rod-roller tension also are within easy reach of the operator.

Loading and return speeds of the pole are 93 fpm. The minimum loading and tamping height is 20 in and maximum is 7 ft 8 in. Speed of lifting is 36 fpm. The vertical mast can be tilted 8 deg forward and 12 deg backward. The chassis, an M-3 Terra-Trac, weighs 9,000 lb with the various auxiliary equipment.

#### Where It Works

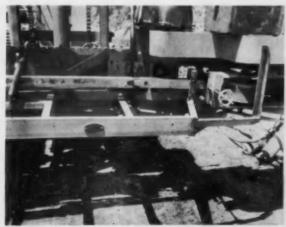
Peabody's Energy mine produces 2,000 tpd from the Illinois No. 5 seam. A 7400 dragline with a 14-cu yd bucket moves 375,000 to 400,000 cu yd of overburden each month in round-the-clock operation.

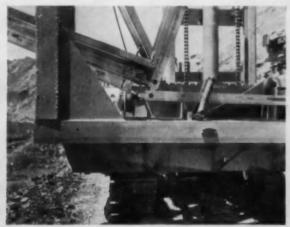
Horizontal 6-in blastholes are

drilled 60 ft deep on 18- to 30-ft centers. Explosives are distributed at each hole by the driver of the supply truck. As he enters the pit he checks with the load-tamp machine operator who then tells him how much to leave at each hole.

If the explosives are being loaded close to the drill, the drill helper fills the stemming bags. If not, the load-tamp operator fills them himself. Holes are laced with Primacord and charged with Olin Mathiesen LX 109 ammonium-nitrate-base explo-sives. Delay connectors are used between holes.

In test runs to determine the capacity of the load-tamp machine, the company reports that an average of three holes can be loaded in 25 min. But this speed is not needed to keep pace with the 14-cu yd dragline.

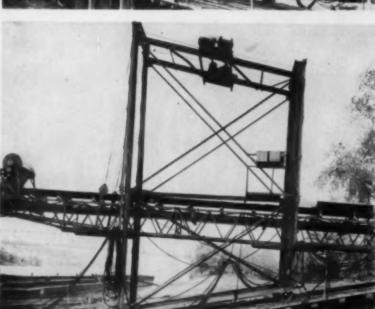




STRAIGHTENED and ready to move into locked position, rod SPECIAL CONNECTIONS on rod sections make rigid joint sections are fed into blasthole by rubber-covered rollers at right. under compression. Joints separate when rod is pulled out.









TRACK-STORAGE FACILITIES (Upper left) accommodate 50 cars. Dump, at right center, is equipped with 5-ton car shaker to speed up unloading.

FLIGHT FEEDER AND BELT (Above) start coal on its way to the river barge.

WHEN WATER IS HIGH No. 2 belt is hoisted out of the series and No. 3 unit (right) is pulled uphill to replace it.

BAIL MOUNTING on railroad-wheel truck permits tilting No. 3 conveyor through a 32-deg arc to compenstate for changes in water level.



WITH TURNTABLE MOUNT, No. 4 conveyor is fed by extension chute. Such chutes eliminated one conveyor.

### How Armco Barge Plant Rebuilt For Higher Capacity

New conveyors raise bargeplant capacity to 900 tph, compared to 250 tph 17 yr ago. Loading over spar barge, plant compensates for high water by hoisting conveyors out of system.



PUTTING OVER 900 TONS of coal into steel barge, operator can move either barge or swivel spout to trim load.

SEVENTEEN YEARS AGO, in the May 1940, issue, Coal Age reported on a then new telescoping conveyor installation at the Huntington (W. Va.) barge-loading plant of the Armco Steel Corp. It was credited with being an important link in the rail-water-rail haul from the company's mines in

West Virginia to their mills in southern Ohio. A saving of 87c in shipping rates over the charges for an all-rail haul was the principal advantage of the installation. Coal brought from the mines by rail was unloaded over the conveyor system into the barges for transfer to Cincinnati and thence by rail to the company's steel mills at Hamilton and Middletown, Ohio.

This conveyor installation, provided by Barber-Greene, continued to operate until a few months ago, handling, in this 17-year period, more than 14,000,000 tons of coal. Today it has been replaced by another Barber-Greene installation of virtually identical design. The old conveyors, far from worn out, have been re-sold to another barge loading operator.

Maintenance had been extremely low. According to Capt. Phil C. Elsey, Armco's superintendent of river transportation, the installation had not experienced as much as 15 min downtime during its use. Total maintenance costs, about \$10,000 over the years (about 1/14c per ton), represented principally belt replacement and the installation of larger motors in an attempt to increase production.

#### Replacement Reasons

Why, then, the replacement? The reason is inherent in capacity figures. The May, 1940, story in Coal Age notes that the plant was designed for 250 tph. The specifications of the new B-G belts call for capacities of 900 tph.

Today coal in quantities up to 150,000 tons per month is brought by rail to Huntington from mines at Montcoal, Robinhood and Slabfork, W. Va. The rail haul is about 125 mi. At the unloading tipple, a 25-ton locomotive is available to spot the cars, of either 50- or 70-ton capacity. Using a 5-ton Hewitt-Robins car shaker, the 50-ton cars are emptied in 3 min and the 70-tonners in 41/2 min. From 70 to 80 cars can be emptied in 8 hr. About 90 cars can be stored on the company property, 50 in line with the unloading hopper and another 40 behind the flood wall of the City of Huntington. All in all, it takes about 1 hr and 10 min to put 965 tons of crushed coal into the 1,000-ton-capacity steel barges. This includes time for re-spotting the cars.

There are 40 barges in the Armco fleet. These are hauled in strings of 10 by one of the company's three paddle-wheel river tugs; "Weber W. Sebale," "Charles R. Hook" and "Geo. M. Verity," the latter being named for the founder of Armco.

#### Meeting River Rises

Like most of the barge-loading or unloading systems along the great river network that lies between the Appalachians and the Mississippi, Armco's installation takes cognizance of the considerable difference in river elevation between pool and flood stage. At Huntington, the pool stage of the Ohio River is 506.5 ft above sea level. At flood stage the level is 560 ft, rising to 569 ft at "extreme flood" stage. While some installations rely entirely on telescoping conveyors which nest one atop the other, the Armco system simply hoists one conveyor out of the line of flow, replacing it with the next conveyor in line, and

All the hoppers, feeders and conveyors are Barber-Greene. The track hoppers are the original ones furnished in 1939, altered to accept two new 36-in by 5-ft 6-in flight feeders. The hoppers and feeders are in a watertight concrete pit, from which the coal is brought out to ground level on a 48-in belt 55 ft long.

Second in the line of flow is the removable conveyor, 48 in, 65 ft. Although it is equipped with supporting legs and a railroad-type truck for positioning, its main support is a permanently mounted channel-frame hoist structure with a 5-hp electric motor. Less than an hour is required to hoist this conveyor out of the line of flow and replace it with the No. 3 belt.

The No. 3 belt is the same as No. 2 and outwardly bears a close resemblence. However, instead of being supported on a permanent structure, the No. 3 conveyor is suspended from a rail-mounted structural hoisting truck. Two 71/2-hp electric gearmotor hoists permit lowering the head end of the conveyor 10 deg below the horizontal, in normal loading attitude, or raising the head end to about 22 deg above horizontal when it is used to replace the No. 2 belt.

A winch, powered by a 10-hp electric motor, pulls the No. 3 conveyor up or lowers it down the plank-and-Ibeam ramp with the hoisting truck supported on industrial railroad wheels and 60-lb rail. This permits telescoping the No. 3 belt under the No. 2 to compensate for minor changes in water level. A continuous loading hopper, with a total length of 35 ft, is fitted to the No. 3 belt to minimize spillage when loading in telescoped position.

#### Filling the Barges

The No. 4 belt, which provides discharge into the barges is mounted on a spar barge 120x24x5-ft in size. To provide telescoping between it and the No. 3 conveyor, the No. 4 unit also is equipped with a continuous loading hopper 23 ft long.

A turntable mounting is provided for the No. 4 belt, as is a swivel discharge spout. The spar barge also contains the winches and controls for spotting the location of the coal barge and spar barge with relation to each other. The turntable mounted discharge belt permits swivelling the conveyor parallel to the axis of the spar barge for moving the barge, or if it is necessary to tie a boat alongside.

All conveyor operating control pushbutton stations are located on the spar barge. The controls are interlocked to halt the operation of all feeders and conveyors simultaneously.

The conveyors presently discharge from one to another over chutes. Even though these chutes are destined for discard after 2 yr or so of use, they have served to eliminate one conveyor from the installation. There were five, not four conveyors in the 1939 installa-

The reason for this lies in the soonto-be-completed (late 1959) Greenup Dam at Greenup, Ky. This will raise the level of the Ohio River, above the dam, about 10 ft. When this rise in level has been accomplished, the four conveyors, without chutes, will be adequate to reach from tipple to barge, even at pool stage. In the meantime the expendable chutes serve to extend the layout sufficiently to permit operation with four conveyors, even at present low pool stage.

#### Redesign Benefits

Armco's new installation, according to Superintendent Elsey, has several advantages beside that of increased capacity. One of these is that the design permits Armco to operate at river stages some 10 ft higher than any of those of neighboring bargeloading plants.

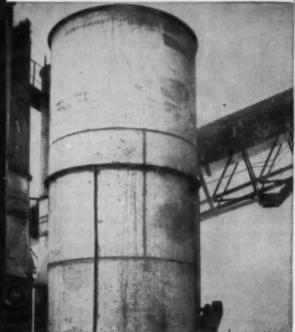
This ability to work a maximum number of days out of the year is important. River traffic, wrongfully considered moribund only a few years ago, is now experiencing a tremendous upswing. Five years ago, 30,000,000 tons of goods passed down the river at Huntington annually. The figure today is 75,000,000 tons. River traffic is a major element in the time required to make the 170-mi river trip from Huntington to Cincinnati. Under optimum conditions it is a good 24-hr trip but river-stage conditions and traffic can double this. With giant mills depending upon a steady supply of coking material, the extra days of operation each year take on an important aspect.

Captain Elsey, veteran of 53 yr on the Mid-West rivers, is one of the best-known figures in water transportation circles. Historian, inventor and river sage, he has been in charge of Armco's water transportation since

Stainless Steel
screen outlasts
carbon steel
4 to 1
and it's still

AT BATON COAL COMPANY RACHEL, W. VA.

going strong



Exhaust gas scrubber. It is made from 3/16" type 304 Stainless.



▲ Stainless Steel screen after one year of service. Previous carbon steel screen lasted only four months.

The big picture shows a Hendrick screen made from type 304 Stainless Steel. It receives about 1,500 tons of coal per day for sizing. The screen replaces a carbon steel screen of identical dimensions. The carbon steel screen blinded in just three months; that is, the holes closed with rust caused by the corrosion and accumulated waste materials.

The Stainless Steel screen, after a *year* of operation, is still in excellent condition, and will undoubtedly serve for a long time to come. It has already handled 500,000 tons.

Stainless Steel is extensively used at this mine as liner material for chutes and sluices. It replaces carbon steel, which, in many cases, has corroded through completely. Another interesting application of Stainless is in the exhaust gas scrubber. The columns are nine feet in diameter and 21 feet tall. They are completely built from type 304 Stainless, which, in the words of the chief engineer, is the only material that could handle the severe corrosion and abrasion involved.

UNITED STATES STEEL CORPORATION, PITTSBURGH - AMERICAN STEEL & WIRE DIVISION, CLEVELAND - COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH - TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. - UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

### USS STAINLESS STEEL

SHEETS . STRIP . PLATES . BARS . BILLETS . PIPE . TUBES . WIRE . SPECIAL SECTIONS



# Foremen's Forum

# Going Back to School?

Develop and improve your supervisory skills by affiliating with a study group. Here are some guides to help you get the most out of such training, either in class or in conference.

THE YOUNGSTERS are back at school for their newest exposure to the learning process. The month of September is a bench mark in our educational background, most of us remembering with fondness our annual return in the Fall to face new experiences. This is a natural time to renew our own interest in making some solid gains in the development of our talents.

As a matter of fact, you may be returning to school yourself. Adult evening sessions will be made available at a number of schools, and you may be thinking of joining the program to improve your competence on the job or to take up a hobby. Many coal companies will resume training programs which have been suspended for the Summer months. Chances are better than even that you, too, will be returning to a school of one kind or another as the youngsters troop back to their desks. We thought it would be a good time to think about the ways and means of getting the most out of the training sessions whether they be formal class sessions or give-and-take conferences.

### Teacher-Student Cooperation

You may have decided to join a class, conducted by a qualified teacher, to increase your skill in a certain pursuit, either manual or mental. Certain characteristics will be common to all such classes whether the subject is welding or advanced accounting. Knowing what these characteristics are will help you get maximum benefit from your participation in the program.

The teacher will be competent and

worthy of your respect. You won't learn a thing if you approach him with any other attitude. Furthermore, he will be prepared in advance to offer a stimulating program, but he will need the full cooperation of his class to make the quality show through.

His teaching method will be firmly established, and you may detect that he operates in a manner somewhat like this:

He explains fully each new phase of the subject when he decides his class is ready to handle the new material.

He demonstrates, if demonstration is necessary, how a new process or technique should be performed.

He asks questions of class members to determine the effectiveness of his explanation and demonstration. If full understanding is lacking, he will no doubt repeat these preliminary steps.

He will organize the class for practical exercises in the application of the new material. He will want to be sure that you can "do" as well as "know."

Then as a final step in the teaching process, he will test your knowledge and ability, using some sort of an examination.

You will recall, we think, that most of the classes you have attended have been conducted in a manner similar to the foregoing 5-step plan. You can get more out of the instruction if you listen closely to the explanation, watch the instructor's deailouring question and clear up fuzzy details during question and answer periods. You will have less trouble with your own application of the new knowl-

edge and with the final test that gages your learning ability.

### Learning in Conference

You may in the near future become a participant of a conferencetype training program. The conference leader, like the instructor, will be thoroughly prepared to conduct fast-moving, rewarding sessions if the conferees cooperate and respond. The responsibilities of conferees are perhaps heavier than those of students in more formal classes. This is a reflection of the fact that the participants in a conference are trained people who convene to trade and share experience. They are personally competent in their profession; they know the fundamentals of their business. You will find that the men in your conference group are working colleagues of yours, as competent as you are and having the same desire to share know-how.

Here are some guiding rules to help you get the greatest benefit from your conference program.

1. Read about, think about and prepare notes in advance on the announced topic of the conference. Most of the teaching in your group will be done by you and the other men in the group. The conference leader may or may not be as well versed in the fine points of the subject as you are. His main function is not to teach, but to channel the discussion toward the realization of his training goals. He will be an expert in this.

2. Contribute to the proceedings. You can't attend these meetings merely as a "warm body" or as an interested bystander. You have ideas born of your own experience. Develop logical explanations of these ideas and present them to the group for discussion and criticism. Everybody gets as everybody gives.



## How to reduce stop-and-go mining

Every time a machine is out because of cable failure, what choice do you have? Either you lose production or you must subject the other equipment used to handle the load of the disabled machine to excessive wear and tear.

But now you can minimize the downtime due to cable failure of continuous mining machines, cutting machines, conveyors and loaders. With Rome portable parallel duplex power cable, you're sure of longer working periods, even under the most grueling mine conditions. Here's why:

 An open fibrous braid around each power conductor provides 360° of balanced adhesion to the Rome 60 (neoprene) sheath.

- This braid also minimizes the individual movement of the conductors within the sheath when the cable is twisted or flexed.
- The specially compounded Rome 60 (neoprene) sheath is highly resistant to acids, alkalis, oils, abrasion and flame.
- For tire-like toughness that gives extra protection against mechanical damage, the Rome 60 sheath is vulcanized in a continuous lead mold.
- 5. Extra overload protection is provided by heat-resistant rubber compound insulation suitable for maximum continuous operation at 75 C. The next time you have to replace a portable mining machine cable, call your Rome Cable distributor. You'll be more than satisfied with the service Rome's cables will provide. Contact your nearest Rome Cable representative for more information—or write to Department 510, Rome Cable Corporation, Rome, New York.

# ROME CABLE

CORPORATION

- 3. Be critical, not sarcastic. Conferences, especially supervisory conferences, usually are expected to produce an agreed-upon course of action which may be written into company policy. It follows that every idea should be closely screened through intelligent criticism. But sarcasm may shut off sources of ideas, because the man whose idea is unfairly criticized may decide to clam up. Furthermore, it's embarrassing to snicker first, then find out you were wrong.
- 4. Don't waste time. Make every effort to stick to the subject. Your conference has goals to reach, and unrelated chatter is a waste of time for busy men.
- 5. Prepare for the sessions. The conference will be of more value to everyone if you and the others spend some time before the sessions in reading related material and in thinking about the coming session.

### The Training Purpose

These training efforts, class or conference, have a final goal of preparing you to operate in your job by valid dead-reckoning. At first glance, we may think of dead-reckoning as a process compounded of equal parts of luck and a mysterious alchemy that works for some fellows and not for others.

Actually, the term dead-reckoning is short for deduced-reckoning, and that casts a different light on the matter. You need a minimum of luck after intelligent deduction. You have heard of fliers and mariners sometimes navigating by dead-reckoning. This merely means that they are experts in applying their knowledge of speed, drift and passage of time to pinpoint with reasonable accuracy their own position in the sky or at sea at any instant of time.

Similarly, a well-trained mine supervisor has such a complete grasp of the fundamentals of his job that he is always oriented in time, place and purpose. He appears to have more than his share of luck and to be especially endowed with the wonderful faculty of being at the right place at the right time, when in reality he is merely proceeding on valid deadireckoning. The purpose of training is to develop these skills, and we hope you will grasp an opportunity this Fall to follow the youngsters back to school.



### Can Coal Move Up This Ladder?

THIS CHART is a report of the National Safety Council on the frequency and severity of industrial accidents in 1956. In presenting the chart in the August issue of Industrial Supervisor, the council points out that the 1956 record shows an 8% improvement in frequency rate and a 10% improvement in severity as compared with 1955 figures. Over the past 20 yr the improvement has been 51% in frequency and 53% in severity. Coal mining, of course, has shown its share of improvement over this period, but it would be heartwarming to see our industry's listing much higher on the chart.

We feel that a move up the ladder can be made if all mines make a concerted effort to reduce roof-fall accidents by 50%, which is the goal of the current industry-wide campaign. The impetus must come from production supervisors who are sincerely concerned about the need for increased roof safety. Don't pass up an opportunity to relay roof-safety messages to your men. You can—if you plug away at the job—make all the men under your supervision fully aware of the ever-present hazards in the roof and ribs.

Substantial gains can be made when everyone, including the production supervisor especially, makes a point of emphasizing roof safety. Developments in Pennsylvania point up the progress that can be made. The safety record for the first half of 1957 in Pennsylvania shapes up as one of the best in recent history. A few years ago, Pennsylvania's mine inspectors and producers decided to conduct a hard-hitting campaign against roof-fall accidents. The result is that the number of roof-fall accidents for the first half of 1957 in both anthracite and bituminous mining is lower than in any similar period over the past 5 yr.

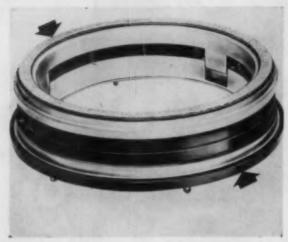


"I sure go for Bethlehem Machine Bolts! They're strong and tough, and come in every size we need."

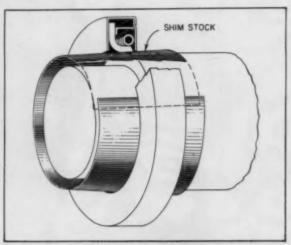
Spikes and track bolts, too!



# Operating Ideas



CORK SEAL is shown at top, neoprene at bottom.



SHIM STOCK provides smooth, slippery surface.

### How to Install Oil Seals Properly

SEALS play an important part in protecting the vital parts of earthmoving machinery. By following correct installation procedures it is possible to prevent costly damage and down time, writes J. B. Sinclair, service department, Caterpillar Tractor Co.

Oil seals are small and low in cost when compared to the cost of a large engine part, such as a crankshaft. But a small seal, if not correctly installed or replaced shortly after a leak occurs, can be responsible for serious damage to an

To get the most from oil seals, you should know where each type is used and correct method to install each type. The

following suggestions are designed to provide useful information on the various seals and thus facilitate their application and use.

A felt seal is ordinarily used where the main job of the seal preventing the entry of dust and the retention of oil or grease is not required. When installing a felt seal, impregnate the seal with lubricating oil to protect it from overheating and wear. If the installation requires that the seal be split, the cut should be made at an angle.

Cork seals are sometimes used instead of felt seals. While these give good protection at temperatures up to 150 deg F, they are not recommended for use where they will be exposed to acids, alkalies or high pressure.

Cork, when used against a solid backing, such as on face-type seals, effectively retains grease in a compartment and excludes water and dirt. When installing a face-type seal with a cork face, coat the cork with graphite grease.

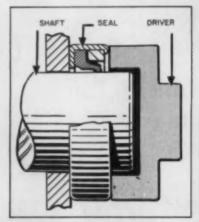
the cork with graphite grease.

Leather and rubber are widely used sealing materials, especially in lip-type seals. But leather is being replaced by synthetic rubber in many applications. The rubber lip seal generally provides better sealing at high speeds, high temperatures and where misalignment and run-out conditions exist. They also are effective dirt seals.

There are definite reasons why rubber seals have not replaced leather in all applications. Unless a rubber seal is recommended, the original leather lip seal should be used.

When possible, prior to installing a leather lip seal, soak the seal in warm oil for about a half hour. A rubber lip seal should just be dipped in oil. Install the seal with the wiping edge turned in the direction recommended. For single lip seals, leather or rubber, it is a general rule that the lip of the seal points toward the material to be sealed. For example, if the job of the seal is to exclude dirt from a compartment, the lip of the seal should be pointed to the outside. If the job is to seal lubricant in a compartment, the lip of the seal should point toward the compartment.

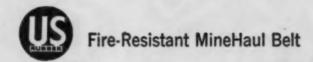
A double-lip seal often has one lip wider than the other. Where such a seal is needed, the spring side with the wider lip should always point toward the lubricant to be sealed. If two compartments



USE proper tools carefully to drive seal.



O-RING SEALS fit groove snugly.

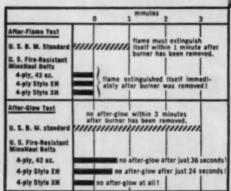


# MEETS and EXCEEDS

all existing fire-resistance regulations

Comparison of
U.S. Fire-Resistant
MineHaul Belts
with standards
as set forth in United
States Bureau of Mines

Schedule 28\*



\*as tested in United States Rubber Company laboratories in accordance with Bureau of Mines test specifications.



Testing these belts in U. S. Rubber's own laboratory—in accordance with Bureau of Mines specifications—it was found that U. S. Fire-Resistant MineHaul Belts not only meet but EXCEED all existing fire-resistance standards (see chart to left).

These new belts have been given the Bureau of Mines acceptance designation: "Fire-Resistant, U.S.B.M. No. 28-5."

U. S. Fire-Resistant MineHaul Belts combine maximum fire safety with all the qualities you've come to expect in a "U.S." belt: optimum troughability, high impact resistance, outstanding rip resistance, excellent fastener-holding ability, added edge protection, mildew resistance—to name a few.

Obtainable at the 28 "U.S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N.Y.



**Mechanical Goods Division** 

**United States Rubber** 

containing lubricant are separated by a double-lip seal, the wider lip should point toward the compartment with the higher pressure or the most fluid.

There are several ways to install liptype seals. If the seal to be installed must pass over a sharp shoulder, keyway or spline, shim stock should be wrapped over these areas and the shim stock lubricated to provide a smooth, slippery surface for the seal lip. If shim stock is not available, a heavy paper coated with grease will work satisfactorily. To drive the seal in place, use a driving member that will press against the outside rim of the seal.

A commonly used synthetic rubber seal is the O-ring seal. This type should be dipped in oil immediately before installing and should be rolled over the shaft on which it is to be installed, or placed into its groove with a minimum of stretching. Also, make sure the O-ring is not twisted when it is placed in its groove. An O-ring seal is inexpensive and conforms to the shape of the groove in which it is installed. They are, therefore, usually replaced at disassem-

bly and seldom resued except in an emergency.

Chevron-type packing seals are generally used in hydraulic cylinders. Direction of assembly is most important to effect a seal with this type of packing. In all applications, this packing should be installed with the point of the chevron toward the flange of the piston. This prevents the lips of the packing from catching on sharp edges. Always use sufficient shims behind the packing gland to give the chevron packing a slight press.





### Reflective Signs Promote Safety

FIRE-CONTROL EQUIPMENT, emergency supplies and caches of Self-Rescuers at mines of the Pittsburgh Coal Co. can be identified from a distance since the company adopted reflective signs made of Scotchlite to mark such

installations. The Scotchlite sheeting (Type 2, adhesive-coated) is cut into letter shapes, treated with Scotchlite A-2 adhesive activator and mounted on Masonite backing boards. The activator insures a strong bond between letters and

board making it impossible to peel off the letters without destroying them. Some fellows have been known to take the letters from less adhesive signs to decorate auto bumpers, hard hats and so on. But now signs remain intact.

# RAILS RECTION A-A

# Underground Auger Recovers Thin Seam in Germany

UNDERGROUND AUGERING has been going through a series of tests at the Friedrick Ernestine mine, Essen, Germany according to the March issue of Iron and Coal Trades Review. An earlier report of this experimental mining method appeared in Gluckauf on January 5, 1957.

Four goals were established before making the tests. These were as follows:

1. Whether hard coal could be augered.

2. Output and costs.

 Whether augering is practicable in a seam with a friable roof and floor, and variable dip between 10 and 25 deg.

4. Whether holes served as reservoirs for gas and water.

To prepare a suitable area to test the auger, two parallel headings were driven 300 ft apart. Breakthroughs were cut 90 deg with the headings on 180-ft centers.

The boring machine, working in the

breakthroughs, augers two successive 90-ft holes from each setup, one to the right and one to the left. About 360 ft can be augered in one shift, including moving and jacking the machine. This would require only one or two moves per shift.

The machine is moved by sliding it along the rails. When a move is completed, the machine is blocked up and wedged into place with jacks extending to the roof. Care must be taken with the relative levels of the blocks so that the auger can be kept in the coal bed. This is especially difficult in a seam with a variable dip.

The sizes of coal produced by the auger were as follows: Plus 2 in, 11.8%; 2x1¼, 13.5%; 1¼x¾, 18.5%; ¾x¾, 32.2%; and ¾x0, 24.0%.

Result of the experimental work indicates that the method is economical in recovering coal from barrier pillars.



# NOW-it's in the bag!

... the answer to your cable fault problems!



### THE O-B CABLE FAULT LOCATOR



## -that's all you carry while testing!

Here's the simplest, lightest, most inexpensive, and easiest-to-use cable fault locator ever offered for mine service! Designed to pinpoint both short and open circuits in trailing cables having two or more conductors — powerful enough to test cables up to 600 feet long. Complete pocket-size package consists of four small extremely rugged elements which are shipped from the factory — and carried around the mine — in the handy canvas bag shown on the previous page.

Only parts carried along the cable by the operator are the slim transistor receiver tube and the lightweight headphones. Turn the page to see how quickly — how easily — the complete unit goes into action!









### THE O-B CABLE FAULT LOCATOR



# -ready for testing in seconds!

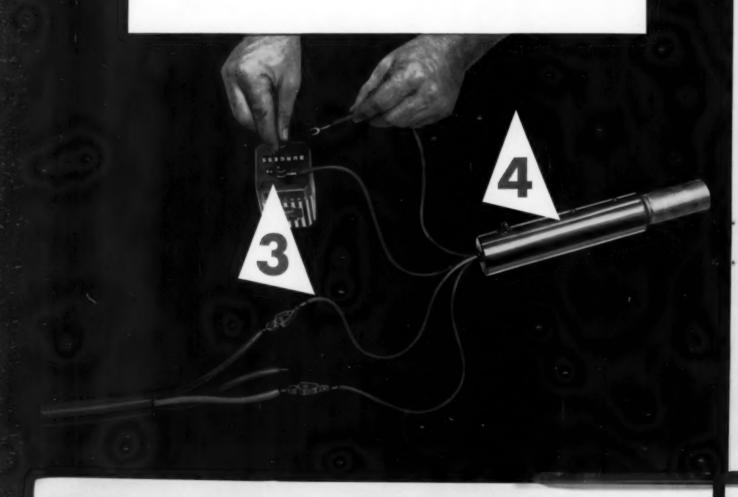
This fault locator was made for rugged use down in the section — not for pampering in storeroom or shop! When a fault hits, grab the bag and take it to the power end of the cable. Disconnect the cable and hook two leads from the signal generator to the battery, two to the power conductors (as shown below).

Then move up the cable with receiver and headphones to pinpoint the fault. Sounds easy — and it is — with the all new O-B Cable Fault Locator, Catalog Number 22567!

Okio Brass.
MANSFIELD BOHIO, U. S. A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4813-M



# The "Air to Spare"

# **Portable Compressor**



The ACME Model 275 is recommended for taking top and bottom, brushing top or rolls and driving rock headings. Plenty of air assured for operating two drifters or air legs. Air cooled and trouble free with an absolute minimum of vibration.

Also built in non-propelled, skid mounted or track mounted models. Bulletin 275 tells the whole story.

### SPECIFICATIONS

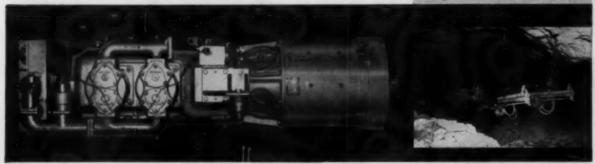
Overall height . 25%" plus ground

Actual air delivery 275 CFM

. 8.25 x 15

. Full hydraulic per

steering
I forward and I reverse
with selector switch



Two stage compressor which actually delivers 275 CFM of air.

The Model 275-SPRHDJ carries 2 drifter arms with two 3 inch class drifters mounted on 6' feed shells.



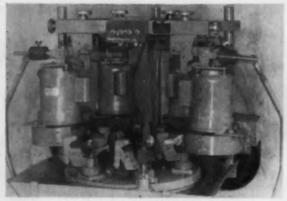
### ACME MACHINERY COMPANY

WILLIAMSON, WEST VIRGINIA

MORGANTOWN, W. VA.

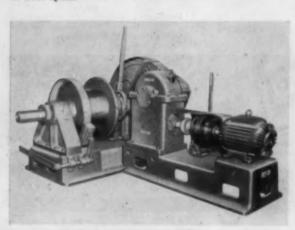
WAREHOUSE AND SALES OFFICE REPRESENTATIVES IN PRINCIPAL MINING AREAS

# **Equipment News**



### Turret Type Bit Sharpener

The semi-automatic bit sharpening machine above is designed with a six-position turret which carries manually-loaded bit holders in progression to four separate grinding positions. The manufacturer, Fairview Bit Co., Fairview, W. Va., says that by thus dividing the sharpening operation into four steps and providing a loading and unloading position, the machine permits an operator to sharpen 250 to 350 bits an hour. One feature built in to the sharpener is the control of speed, which can be varied instantly to suit the condition of the bits being sharpened. Other advantages are: 1) uniformly maintained clearance angles; smooth surface finishing with the result of cutting efficiency and improved bit life. The manufacturer also declares that since the sharpener is designed simply but ruggedly low maintenance costs are assured. A compact unit, the sharpener requires approximately 3 ft of floor space.

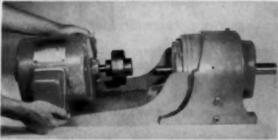


### Two-Section Car Puller

The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kan., has developed a two-section car puller that is designed for handling and spotting all types of rail cars. Mounted on a rigid semisteel cast base, the car puller is shipped in two sections. On delivery the sections are joined by a few bolts. Other design features disclosed by the company include a torque converter mounted directly on the motor shaft, with output torque controlled by a shifting lever. The control may be operated manually or by air cylinders. The converter is designed with a range of torque from 10% to 100% rated load. For example, a

50-hp unit can be varied to pull from 5 hp to 50 hp. The puller uses a worm-gear type reducer.







### G. E. Gear Motor Line

General Electric Co., Gear Motor & Transmission Components Dept., Paterson, N.J., has introduced a line of integral horsepower gear motors and related transmission equipment. Behind GE's move into the new line is a plan to offer gear motors and related transmission equipment as "shelf goods" rather than specialized products. Thus, to begin, the new line will consist of three basic components: an integral type gear motor (top), an all-motor gear motor (center), and a separate helical speed reducer (bottom). The integral type gear motor is just that—gear and drive motor are packaged into a single unit. The all-motor type features a design in which the drive motor is coupled to the gear reducer and mounted on a common carrier. The separate helical speed reducer is designed for use with a variety of prime movers. Mounting dimensions for all three products are identical. Parts are interchangeable, thus permitting a user flexibility in stocking them. The line will be offered in three basic types of speed reductions: 1) single reduction offset shaft in speed ranges from 780 to 350 tpm; 2) double reduction concentric shaft for speeds from 350 to 37

# 672 holes a day

...two-shift performance of seven RBD-30 Roof Bolting Units at the Island Creek Coal Company



Island Creek Coal Company's #3 Elkhorn Seam in Kentucky averages only 34 inches in height—a real tight squeeze. But not for the CP Roof Bolter! The RBD-30 is only 28 inches high. It moves into low seams, drills at 4 feet per minute, and sets the expansion bolt. On occasion, performance has reached 840 holes a day. Pantograph mounting of drill and bolt-setting motor eliminates need for repositioning. A six-inch auger adjustment on the telescopic chuck overcomes the problem of roof irregularities. Available in self-propelled and standard types—both ideal for low coal conditions. Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.



# Chicago Pneumatic

PREUMATIC TOOLS . AIR COMPRESSORS . ELECTRIC TOOLS . DIESEL ENGINES . ROCK DRILLS . HYDRAULIC TOOLS . VACUUM PUMPS . AVIATION ACCESSORIES

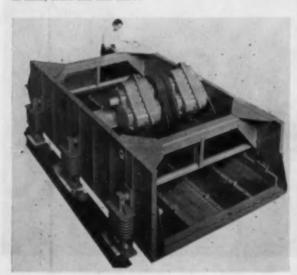
rpm; and 3) triple reduction concentric shaft for output speeds from 30 to 13.5 rpm.

The integral type gear motors will be available in ratings from 1 to 30 hp. The first ratings, up to 10 hp, will be announced by General Electric October 1. By February the remaining ratings—to 30 hp—will be announced. The separate helical speed reducers and the all-motor gear motors will be developed from 1 to 75 hp by July, 1958.



### Earthmover Tire Service Unit

Devised especially to provide on-the-job service for large earthmover tires, the B. F. Goodrich Co. contractor service truck is an International four-wheel drive model rated at 15,000 lb gyw. It is capable, says Goodrich, of carrying three 24.00x29 tires or two 37.5x33 tires. Its equipment includes a 50-cu ft air compressor, power tools, floodlights, a 5,000-lb crane and hydraulic levelers at the rear for stabilizing the truck while servicing. Four-wheel drive enables the truck to operate in sand, loose soil and snow.



### 8-Ft Wide Vibrating Screen

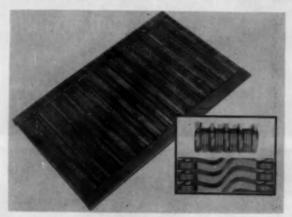
Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., has begun a anufacturing vibrating screens with 8-ft widths. The company points out that the screen, named the "Low-Head," will take the place of two screens, eliminating dual components such as motors, drives and controls. Further, the larger screen, says Allis-Chalmers, will reduce installation costs, since extra hoppers, chute and other auxiliary equipment is eliminated. Thus far the company has produced an 8x16-ft model. Its features include twin vibrating mechanism with a center drive, and two sheaves coupled with a flexible synchronizing pin.

### **Design Permits Power Choice**

The Model JMT "Mobiljumbo," a development of Gardner-Denver Co., Quincy, Ill., is a self-propelled, crawler-mounted



unit powered by either diesel-hydraulic drive or by five-cylinder radial air motors. The JMT is furnished with two or three creep-free hydraulic booms, and rock drills and feeds may be selected to suit the ground being drilled. An air motor drives the unit's hydraulic pump for remote control of the boom and for drill positioning by one man. An electric generator, air motor-driven, supplies three lights that flood the working face.



### **Preparation Screen**

One of Wedge-Wire Corp.'s newest screens is the "S" Kleenslot, a unit designed especially for applications where screening flats or slivers is of prime consideration. The specialized job of ridding coal of flats and slivers is accomplished by an "S" bend in the screen's wire, a feature that reduces the normally long slot. (Wedge-Wire says this particular type of screen can also be furnished with a "C" bend.) Although different in appearance and specific purpose than usual type screens, the "S" contains such established features as non-blinding and non-clogging.



### Ripper Cuts Blasting Costs

Crutcher-Rolfs-Cummings, Inc. manufacturer of the CRC Kelley ripper, reports that the unit, which was originally designed to rip through laminated rock ahead of ditching machines on pipe lines, is being applied on jobs at western strip

# B.F. Goodrich



Three retreads . . . still going strong

20 hours a day, 6 days a week, this truck hauls giant loads of coal over West Virginia and Pennsylvania roads covered with slag and stony shale. It's tire-killing work, yet these B.F. Goodrich Universals have been retreaded three times and are still going strong.



Full traction up steep grades

Trucks like this one carry anthracite—coal loads as heavy as 30 tons, up steep roads strewn with razor-sharp rock. But B.F.Goodrich Universal tires give positive traction, and more than 3,300 hours of service before retreading!

# Miners get more retreads, better traction, bigger savings with B.F.Goodrich tires!



50% saving The wheels of this truck roll over some of the roughest terrain in the Pennsylvania anthracite region. But their B.F. Goodrich Universal tires stand up so well, they can be retreaded to give an additional 75% of new tire performance. No wonder the operator saves as much as 50% with B.F. Goodrich tires.

REPEATED experiences of miners—like the three shown here—prove that B.F. Goodrich FLEX-RITE NYLON Universal tires give more retreads, superior traction and bigger savings. Reason: the combination of the Universal tread design and the B.F. Goodrich FLEX-RITE NYLON cord body.

Husky, wedge-shaped cleats grip the ground for positive traction. The B.F. Goodrich FLEX-RITE NYLON cord body is stronger than ordinary cord materials, withstands double the impact and resists heat blowouts and flex breaks. Result: the B.F. Goodrich cord body outwears even the extra-thick tread, can be retreaded over and over.

Your B.F. Goodrich dealer has a tire for every kind of mining work. See him today or write: B.F. Goodrich Tire Company, A Division of The B.F. Goodrich Company, Akron 18, O.

Specify

B.F.Goodrich tires
when ordering
new equipment



Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

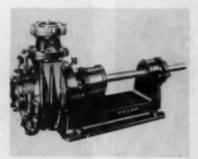
### Equipment News (Continued)

mines. The ripper, which is composed of a large steel shank with a boot, is forced into the ground by a hydraulically operated tool bar attached to the rear of a crawler tractor. The tractor operator raises and lowers the shank, and is able to maintain accurately a ripping depth as deep as 7 ft using D-9 size rippers. The company says the ripper will account for substantial savings by eliminating costly blasting. Units are available for the D-9, D-8, and D-7 class crawler tractors. Crutcher-Rolfs-Cummings, Inc., Box 2073, Huston 1, Texas.



### Current Collector

Ohio Brass Co., Mansfield, Ohio, has developed the Type-EHD current collector expressly for heavy locomotives (35 to 50 tons) drawing high operating currents. Reportedly the collector guides itself through frogs or special overhead assemblies and sharply reduces dewirements at any speed. The new collector can be mounted on a standard Ohio Brass pole-head casting; thus any change-over to the new assembly can be made quickly. The company says that definite savings are possible with the EHD because of its improved running efficiency and increased glider service life.



### Slurry Pump

The Krogh Model 600 pump above is a heavy duty, fully-lined sand and slurry pump equipped with wear-resistant liners, replaceable and interchangeable with either hard metal or rubber. The manufacturer, Krogh Pump & Equipment Co., Inc., 515 Harrison St., San Francisco 5, Cal., says the pump represents a completely new design in sand and slurry pumps. Its liner flexibility, Krogh points out, makes the pump suitable for any type of slurry pumping problem and also permits it to accommodate changes in operating conditions without expensive pump modifications or installation changes. Krogh recommends the units for pumping sand, slurries or gritty water in flotation processes, cyclone feed, refuse or tailings disposal, ash handling, thickener underflow, washing and pipelines. Units range in size from 2 in to 8 in with capacities from 20 to 2,000 gpm up to 100-ft head or more.



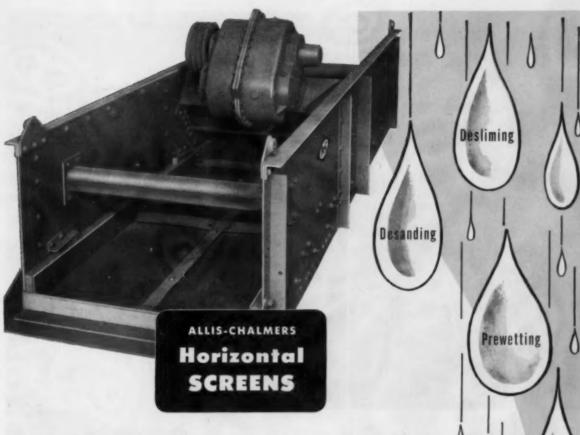
### Drag Bit Drill Head

The rate of air-blast drilling in soft rock formations reportedly is increased greatly by a new drag bit drill head manufactured by the Austin Powder Co., Cleveland 13, Ohio. The company says that its Model APA will cut through soft shales, clays, shells, soft limestone, red beds and other rocks with low compressive strength in less than half the time required by ordinary drill heads equipped with rotating bits. Austin adds that the APA is designed with no independently moving parts that will become clogged. In addition only moderate weight is needed to achieve effectiveness. The APA head is furnished with carbidetipped bits, which are designed with tapered shanks that drive-fit into the drill head. The head is being offered in live sizes for holes from 4% in to 8% in, and with square and hexagonal shanks.

### Underground Lighting

Femco, Inc., Irwin, Pa., has announced Mine-Lite lighting systems for use in working areas up to the face. Approved by the U. S. Bureau of Mines, the systems are fluorescent and can be used in gassy atmospheres. Femco says the lamp units are inherently safe and cannot explode or cause fires. Each lamp unit contains two fluorescent tubes, a reflector, a heavy clear plastic tube, an aluminum cap with a handle, and a sealed ballast in the aluminum base. The lamp's weight is 12 lb, its voltage—230 v AC. Femco says





The OVERWHELMING CHOICE for the Rough-Tough Job of

**Coal Dewatering** 

IN any preparation plant you're almost sure to see Allis-Chalmers screens on all the tough dewatering jobs. Why this marked preference? The most important reason is that the coal industry itself has had a constant influence on the development of this outstanding performer. Throughout the past quarter century, the cooperation of plant operators has enabled Allis-Chalmers to design and build the sturdy, efficient screen needed for dewatering operations.

### **Help for Tipple Manufacturers**

Close contact with the coal industry has

also given Allis-Chalmers a vast volume of application information. This invaluable data on capacities, surface moistures and other variables is available to tipple manufacturers and operators—for determining flow sheets and the selection of heat driers, centrifuges, etc.

### Solids Recovery

Allis-Chalmers vibrating screens are widely used to close circuit a plant in conjunction with cyclones and/or thickeners for recovery of solids, fine coal and refuse, and to prevent stream pollution.

For complete information, see your Allis-Chalmers representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.



**ALLIS-CHALMERS** 

Media

ecovery

Final

ewatering



First step to successful blasting . . .

### **AUSTIN EXPLOSIVES**

Each blasting operation has conditions which make it unique. These may be in the form of hardness of the rock to be shot, excessive moisture, fragmentation desired . . . or the amount of ventilation available if working in underground areas.

Austin produces an explosive to successfully meet every combination of conditions. Among its complete stocks are ammonia grades, ammonia gelatins, permissible dynamites, nitroglycerin and nitroglycerin gelatins.

### AUSTIN AKREMITE

A popular item in the Austin line is Akremite. This combination of insensitive ammonlum nitrate with carbon is safer . . . simpler to use ... easier to store. Where applicable, it can cut blasting costs up to 50%.

There is an Austin explosives engineer in your area. He'll be glad to survey your job requirements and make common sense suggestions on how you can cut costs and increase production with Austin explosives.



permissible dynamites + mine tools explosives . detonating fuse and clips . AP drill heads . Akremite . primers

### Equipment News (Continued)



the voltage permits cool operation with long lengths of cable. Forty lamp units containing 80 fluorescent tubes use only 10 amp. Femco points out, too, that if a lamp is dropped its base will strike first because of the ballast.



### Mobile Personnel Tower

Mobile Aerial Towers, Inc., 2224 St. Joe. Blvd., Fort Wayne, Ind., has introduced a series of personnel platform towers. Named Hi-Rangers, the towers are made in three series-Nos. 5, 7 and 10-and have maximum reaches of 24 to 100 ft. A man in the personnel basket-or platform-can raise, lower,

- Keep coal from freezing
- Build better customer relations
- Speed car turn-around



Order Sterling Rock Sult now—regular or "Inhibium Treated" for maximum protection against corrosion of metal equipment. Available in bulk or handy 100-lb. bags from International's strategically located mines.

### ... treat your coal shipments with Sterling Rock Salt

It takes so little time and effort to apply Sterling Rock Salt! Just two to four bags of this effective antifreeze agent will keep an entire carload of coal from freezing. Sterling Rock Salt can be quickly applied, handles easily, is harmless to hands and clothing. It dissolves slowly, to give long-lasting antifreeze action. Your customers will gladly pay the small premium for coal they can unload without first having to thaw it out.

You can also use Sterling Rock Salt to prevent frozen scales and switches... and to keep roads and yards clear throughout the winter. It removes snow and ice fast.

### INTERNATIONAL SALT CO., SCRANTON, PA.

Sales offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N.Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; and Richmond, Va.

STERLING SALT
PRODUCT OF INTERNATIONAL SALT CO., INC.

# CONCAVE SIDES make V-belts last longer



See for yourself why the concave sides (Fig. 1) of a Gates V-Belt greatly lengthen its life. Just do this:

Bend a Gates belt and feel the sides. Note how these precisely engineered concave sides fill out on the bend and become straight. Thus a Gates belt grips the sheave groove evenly (Fig. 1-A) and wear is distributed uniformly across each side of the belt. That means longer belt life; lower costs.

Make the same test with a straight-sided belt (Fig. 2) and see what happens. The sides bulge out on the bend (Fig. 2-A) concentrating the wear at points shown by arrows.

For longer belt life...lower belt costs, specify the V-belt with Concave sides—Gates Vulco Rope...readily available from nearby distributor stocks.











Write for free copy of — "How Coal Mines are Cutting Costs" Gates Rubber Company Sales Division, Inc. Dept. 104-C, Denver, Colorado

Gates VILLE Drives

### Equipment News (Continued)

turn, back or advance his position above the ground. Lifting capacities range from 500 lb to 2,000 lb. Mobile Aerial Towers says the towers can be mounted on almost any industrial vehicle capable of bearing the required work load. Electric lines, lights and high pressure water lines can be installed.



### Hanger Tester

Ohio Brass Co., Mansfield, Ohio, is producing a mine hanger tester which is said to provide a simple, yet foolproof testing method. The unit, which consists of a testing unit, contact hook and ground wire, can be operated on a line or in a shop. Four steps are required for testing:

1) removal of wire from clamp and hanger; 2) hanger shell ground wire is attached to rail; 3) hook-type contact is placed on the trolley wire; 4) the stud of the tester is touched to the trolley clamp.



### Steam Cleaners

Three models of direct-fired steam cleaners are being marketed by the Kelite Corp. The smallest cleaner, the Mark I, is designed for light to medium duty, and has an output of 120 gal per hr. The Mark II, a medium to heavy duty unit, has a 200-gph output. And the Mark III, a maximum duty cleaner, an



# J&L CENTERFIT WIRE ROPE toughest combination of strength and flexibility ever designed

On jobs where shock, severe bending and extreme loading are a problem, CenterFit wire rope gives you extra service life.

CenterFit is your best wire rope for back hoe pull ropes, shovel hoist ropes and clamshell holding and closing lines where overloading may occur. Here's why:

- CenterFit is the strongest standard wire rope produced
- \* More external and internal bearing surface
- \* Greater flexibility
- Extra metallic area of the cross section with more equal stress distribution among the strands.



Jones & Laughlin

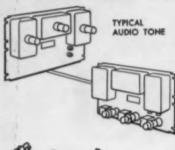
... a great name in steel

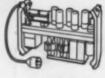
CenterFit's longer service life means less down time, lower operating costs. Send coupon today for complete information.

Jones & Laugh Wire Rope Div Muncy, Penns		ation
☐ Please send on CENTER☐ Have repre	RFIT wire rope.	
Name		
Title		
Company	- 1/15	
City	Zone	State

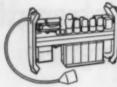








TYPICAL CARRIER CONTROL



FOR FEMCO ENGINEERED CONTROL SYSTEMS

Fan Signals \* Circuit Breakers Sub Stations \* Pump Control Supervisory Control

### FEMCO TROLLEYPHONES AND AUDIOPHONES Small Units—Easy to Install





PERMISSIBLE MINE LIGHT

### SALES AND SERVICE AGENCIES FOR MINE COMMUNICATION

UNderhill 3-3200 Femco. Inc.



Equipment News (Continued)

output of 300 gph. All three steam cleaners are rated at 320 deg. Standard equipment includes a steam cleaning gun, a Hy-Vel spray nozzle, and a heavy duty hose. Optional equipment includes a nozzle control for gas-fired models, a trailer or caster mounting for oil-fired models; and an extra-heavy duty wire-braid hose. Kelite Corp., 81 Industrial Rd., Berkeley Heights, N. J.



### Rippers

The Greenville Steel Car Co., Ateco Div., Greenville, Pa., is manufacturing tractor-mounted rippers for use with International tractors TD-14, TD-18, and TD-24. The rippers are swivel-mounted, and can turn 15 deg right or left. Depth and pitch adjustment can be set for each specific job. A three-shank unit weighs 5 tons and rips to 24 in, according to the company. Other features: a special drawbar which replaces a tractor drawbar and brackets to take full tractor pull; hydraulic power; and short turn maneuver-



### High Pressure Hose

Acme Gold Seal air hose, a flexible, high pressure wire-braided hose, is being sold by the Acme Rubber Mfg. Co., Div. of Acme-Hamilton Mfg. Corp., 115
Meade St., Trenton, N. J. Acme says the hose will withstand pressures up to 1,500 psi, and recommends its use in heavy duty work where external abrasion is a problem and maximum flexibility plus weight are important factors. The hose's



# Why neoprene conveyor belting is the most inexpensive you can buy

A remarkable combination of properties makes a neoprene-covered belt the true economy buy for mine conveyors. Low first cost? Not as low as some other types.

But consider what you get when you specify neoprene. First, there is neoprene's resistance—unmatched in other belting materials—to deterioration by lubricating oil and grease that often drips from pulley bearings onto the belt. Next is neoprene's resistance to abrasion. It's tough and resilient enough to take the crushing impact of coal and rock year after year without going

to pieces. Then there's neoprene's protection against the effects of acid water, eliminating deterioration of the fabric by mold and mildew. Finally, its fire-resistance adds a safety factor. Neoprene will not support combustion.

You'll pay a little more for neoprene-covered belts. But your investment will be returned in long, trouble-free wear. Neoprene's proved service record is its own best salesman. One 4000-foot belt, still in use after 16 years hauling oilsprayed coal at a New England power plant, is an example of how really inexpensive neoprene can be.

We would like to tell you more about this versatile synthetic rubber—made by Du Pont for 25 years. A request will put your name on our mailing list for free copies of the ELASTOMERS NOTEBOOK. Just write: E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Dept. CO-9, Wilmington 98, Delaware.



Better Things for Better Living
...through Chemistry

# TIMER RELAY that handles all controlled timing problems . . .

- \* No false contacts
- \* Non sticking
- \* Practically "fail safe"
- \* Low cost timer

# Durakool

STEEL MERCURY TIMERS

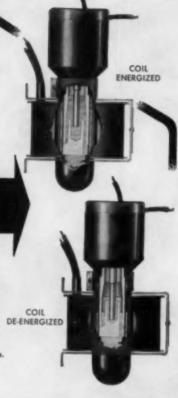
This steel clad, factory set, tamper proof Durakool timer-relay is practically non-breakable. Operating life multiplied 5 to 6 times by new plunger construction features. Combinations of operate-release time delays from 0.15 sec. to 20 sec.—either normally open or normally closed action.

See telephone directory for local distributor, or write.

DURAKOOL, INC.

ELKHART, INDIANA, U.S.A.

700 WESTON RD., TORONTO 9, CANADA



# CUT MAINTENANCE COSTS! SAVE DOWN TIME! on your Hydraulic System

Keep it clean with

SCHROEDER LINE FILTERS

The Schroeder Line Filter is the answer to keeping harmful dirt from slowing down the operation of your hydraulic equipment. This small, all-in-one unit has a large filtering capacity and removes damaging particles too small to be seen.

### Here's why SCHROEDER LINE FILTERS are preferred:

- Filter element costs little and is replaceable.
- Fliptop cap permits minute change of element.
- Designed for space-saving installation.
- Many types and makes of filter elements available.
- Minimum cost for maximum filtrae tion area.
- Element protected by built-in bypass relief.
- Built-in orifice for partial filtration available.
- Working pressures conservatively rated—each unit shop-tested.

Optional Spin-Dicator provides visual supervision all performance.

### SCHROEDER BROTHERS CORPORATION

NICHOL AVE., BOX 72, McKEES ROCKS, PA. (Pittsburgh District)

Hydraulic, Electric and Pnoumatic Equipment

REDUCE WEAR AND DOWN TIME...Install SCHROEDER LINE FILTERS

### Equipment News (Continued)

construction consists of a neoprene tube, a one or two strand wire braid and an abrasion-resistant hard rubber cover.



### Test Stand

A new bench-type hydraulic and pneumatic test stand developed by the Farris Engineering Corp. is self-contained, low in cost and portable. Chief feature: it can be operated by anyone without previous training. Named the "Porta-Tester," the test stand is designed to test safety and relief valves, globe, gate, plug and other valves, piping and pump cases. It is suitable, according to the manufacturer, for liquid testing up to 3,000 psi. Farris Engineering Corp., 586 Commercial Ave., Palisades Park, N. J.



### Cable Fault Locator

Ohio Brass Co., Mansfield, Ohio, says its new O-B pocket-size cable fault locator will answer a demand for a simple, lightweight and inexpensive device for locating short circuits and open circuits in mine trailing cables equipped with two or more conductors. The compactness of the locator was accomplished by the use of transistors in the signal generator and receiver. Ohio Brass says the device is suitable for testing cables

### HIGH-PRODUCTION ROCK HAULER



# CAT\* DW21-PR21 units climb stiff grades, make 600-yard round trips in 6½ minutes cycle time

This is one of two DW21 Tractors with Athey PR21 Rear Dump Trailers used by Newport Excavating Co. to remove overburden from an open pit coal mine at Nanticoke, Pa. Shovel-loaded, each unit handles an average load of 25 cubic yards of hard rock, pulls it up a 7½% grade out of the pit, and makes the 600-yard round trip in 6½ minutes.

These big, tough haulers work steadily, 24 hours a day, five days a week. Their short turning radius and great maneuverability make them fast workers around the shovel and on the dump.

Perfectly matched to the rugged PR21, the new Caterpillar DW21 (Series C) develops high usable rimpull. Its heavy-duty Turbocharged Cat Engine delivers 300 HP (maximum output). What's more, because of its four-cycle design, the engine gives you dependable power with a minimum of maintenance. No fuel adjustments are required. There are no cylinder ports or air boxes to clean. And low-cost No. 2 furnace oil can be used without fouling.

Among other features that boost production are: automotive-feel, hydraulic steering for easy, fast maneuvering and wide-section 29.5 x 29 tubeless tires for maximum flotation and sure-footed traction. The tubeless tires, pioneered in earthmoving use by Caterpillar, bring real cost savings over old-fashioned tubes and flaps.

For economical removal of rocky overburden you can't beat the DW21-PR21 in rock work. Your Caterpillar Dealer, who backs you with prompt service and parts you can trust, will gladly give you complete details of its performance. Call him today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR'

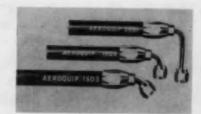
HEAVY-DUTY EQUIPMENT FOR THE HARD WORK

### Equipment News (Continued)

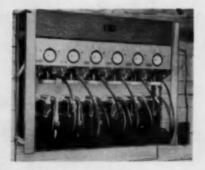
up to 600 ft long. In operation the locator's 6-v battery and signal generator are attached to the end of a cable in a few seconds. The operator carries only headphones and a receiver during testing. Total weight of the locator is 4 lb.

### Hose Elbow Fittings

A line of elbow fittings manufactured by the Aeroquip Corp., Jackson, Mich., is designed to simplify installation of hose assemblies in confined spaces. The

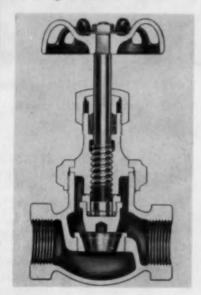


company says the fittings eliminate the need for combinations of standard elbows and adapters plus straight hose fittings. Chief advantages of the assemblies, which are described in Bulletin IEB 27, are less flow restriction, space saving and reusability of the fittings. The elbows are manufactured in 45 deg and 90 deg configurations.



### Six-Lamp Charger

National Mine Service Co., 564 Alcoa Bldg., Pittsburgh, Pa., is manufacturing a Wheat lamp charger that accepts six lamps for flexible taper charging. The company says that prior units accepted a minimum of 50 lamps. The new unit will charge from 1 to 6 lamps, including lamps that have been in use for only 1 or 2 hr together with lamps that have been in use 8 hr or 10 hr. All the lamps, according to National Mine, will receive satisfactory charges without adjusting the charger. In addition the lamps can be left charging for extended periods without damage or excessive water loss.



### Plug Type Valves

Plug type globe and angle valves with 500-plus Brinell hardened stainless steel seats and discs are being added to the industrial valve line manufactured by the Ohio Brass Co., Mansfield, Ohio. The valves are made in 150- and 200-lb working steam pressure classes, and are designed for use where frequent operation causes excessive wear or where corrosive service affects closure surfaces. Ohio Brass recommends the valves for



Insure your profits with

# Ludlow-Saylor

WOVEN WIRE SCREENS

Keep your screening and sizing operation costs in the black with L-S Screens. They give better resistance to wear and vibration because they're tougher, stronger and more rigid... screen openings stay accurate indefinitely... edges are more carefully finished. L-S Screens reduce downtime and replacement expense, insure better product uniformity and higher output at far lower cost per ton. Make your next replacements L-S woven wire screens.

Immediate Shipment on most weaves and sizes

Write For Condensed Screen Reference Catalog



Ludiow-Saylor designs and builds its own learns to produce better wire cloth and screens of stainless, monel, bronze, copper, brass, oil-tempered, high-carbon, or any other wire.

LUDLOW-SAYLOR WIRE CLOTH CO. 609 South Newslead Ave. . 31. Louis 10, Me.

SÁLES OFFICES: Birmingham, 1727 Sixth Ave., North; Chicago, 5807 W. Diversey; Pittsburgh, Union Trust Building; Houston, 1213 Capitol Ave.; Denver, 1530 Carr St.; WEST COAST: Star Wire Screen and Iron Works, Inc., 2515 San Fernando Road, Los Angelos; Subsidiary, Ludlow-Saylor Wire Cloth Co.





Valve on left is from compressor run for 3,000 hours with well-known, high-grade oil. At right is same valve after a 3,000-hour run with Sun Solnus oil. Note difference in carbon deposits.

# 3000-HOUR TEST PROVES SUN SOLNUS OILS REDUCE CARBON BUILD-UP IN COMPRESSORS

**Equipment:** A three-stage Norwalk horizontal-type compressor. Operating pressure: from 1,000 to 1,500 psi.

**Test:** The compressor was cleaned thoroughly and filled with a well-known, high-grade oil. The equipment was run for 3,000 hours, then torn down for inspection and cleaning. Then Solnus® 300 was tested in the same way.

**Results:** Look at the two pictures. You can see for yourself how Solnus oil reduced dangerous carbon build-up.

All types of reciprocating air compressors that have been changed over to a Sun Solnus oil show similar results. A test in your compressor will show the same remarkable reduction of carbon deposits.

You can get a technical bulletin about Sun Solnus oils by asking your Sun representative, or write to Sun Oil Company, Philadelphia 3, Pa., Dept. I-52.

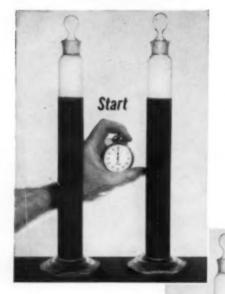


# SUN OIL COMPANY PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

Another new development using

# B.F.Goodrich Chemical raw materials



Start: Flocculant test in typical coal washery slurries begins with 1.2 parts of Good-rite K-720 per million parts of slurry in graduate at right.

Seconds

### GOOD-RITE K-720

new flocculant speeds clean-up of coal washery fines

REGARDLESS of the flocculant you are now using, smaller amounts of new Good-rite K-720 flocculating agent can do a faster job of settling coal fines in your thickener. With this higher thickener efficiency, some coal processors can step up effluent discharge rates and increase water recovery volumes to boost coal cleaning capacities. Others can realize cost savings through decreased flocculant requirements.

A range of .016 to .08 pounds of Good-rite K-720 per ton of solids in normal coal processing slurries can effectively settle fines so that overflows contain far less solids than allowed by State anti-pollution laws.

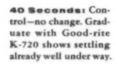
For Service Bulletins on Good-rite flocculants, write Dept. KK-2, B.F.Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio, Cable address: Goodchemco, In Canada: Kitchener, Ontario.

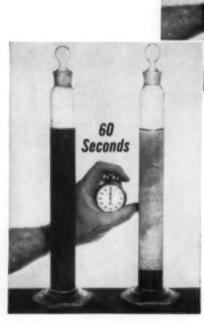
### AVAILABLE AS A 20% WATER SOLUTION:

Good-rite K-720 flocculating agent is also supplied at no extra delivered cost as Good-rite K-720S-a 20% water solution which simplifies and minimizes the labor needed for the handling and mixing of dry flocculant prior to addition to slurries.



**B.F.Goodrich Chemical Company** a division of The B.F.Goodrich Company

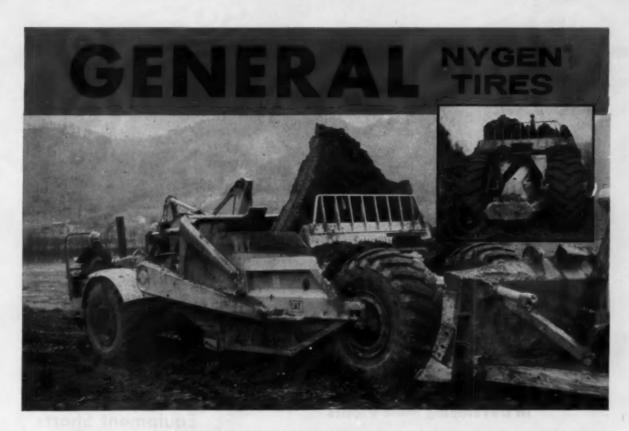




60 Seconda: Control-no change. Graduate with Good-rite K-720 displays settling virtually complete and sludge in compression.



B.F.Goodrich/ GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors



# SPEED UP MOVING 6-MILLION YDS. OF DIRT FOR ALLEGHENY CONTRACTING INDUSTRIES ON HUGE \$153-MILLION

### INDUSTRIAL DEVELOPMENT!

Here, as on thousands of other construction jobs, General Nygen Tires are proving that superior strength *plus* crawler-like traction and flotation, gets the job done faster and *for less!* 

Built with exclusive stronger-than-steel Nygen Cord and featuring extra wide, extra deep treads, Generals are unequalled for deep-down drive and dependability.

Hand General Nygen Tires your toughest assignment today and watch them save time . . . build profits!



specify GENERALS on your new equipment



THE GENERAL TIRE & RUBBER CO. . Akron, Ohio

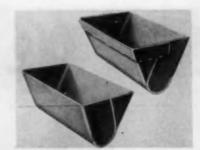
H.C.T.

### Equipment News (Continued)

closely throttling steam, water, oil, and air. They are available in eight sizes from ¼ in to 2 in.

### Elevator Buckets

The "J" bucket, the name of a new line of welded-steel elevator buckets, is being manufactured by Wincar Welders, 3249 Cherry Ave., Long Beach, Cal. Manufactured in standard type A, AA and AA-RB sizes, the buckets are brakeformed from a shaped steel plate. The



tradename "J" bucket stems from the mark formed by welding (see photo).

The maker says the buckets are light in weight, yet extremely strong and longlived. Corners are round, free of welds and other irregularities.



### Lubricant, Sprayer

Tower Oil Co., 300 W. Washington St., Chicago 3, Ill., is marketing a new sprayer for applying the company's molybdenum disulphide lubricant. The lubricant, Micro-Moly, is being packaged in a self-pressurized 5-gal container to which is attached a spray gun and 9 ft of hose. Container, gun and hose are returnable for credit.

### **Equipment Shorts**

CURRENT METER—An AC meter made by John W. Hobbs Corp., Spring-field, Ill., logs total hours of machine or equipment operation. Available in 120 v, 240 v, 480 v in 50 or 60 cycles. The company's Sales Div. will send Catalog AC 587B on request.

NYLON SCREEN FILTERS—Danco filters, custom-molded in types, sizes and shapes to meet specific filtering requirements, are being made by the Danielson Mfg. Co., Danielson, Conn. The company recommends the units for filtering lube, diesel and hydraulic oils, water, gasoline, cutting oils and air.

BUCKET POSITIONING — Automatic bucket positioners for the No. 955 and No. 933 Traxcavators have been announced by the Caterpillar Tractor Co. The positioning feature has been a standard device on the No. 977 Traxcavator. Installed, the positioner moves the bucket tilt control lever from the tilt-back position to the hold position when the bucket reaches a preset digging angle. Adjustable linkage permits the bucket to be positioned at any point between an approximate 5 deg digging angle and a 3 deg tilt-back angle.

TRACTOR—The Model 840 four-wheel tractor introduced by Ford Motor Co. recently is equipped with a four-speed transmission and 172 cu in piston displacement engine. The tractor is one of Ford's 800 Series tractors, which can be equipped with over-and-under transmis-

# **Announcement**

New Features now make the Nolan Hydraulic PORTA-FEEDER More Valuable than Ever in Developing Mine Profits

The NOLAN HYDRAULIC Porta-Feeder will help you meet every requirement and condition in spotting cars for loading from shuttle cars and belts. Push button control or fully automatic with automatic gato.

There are hundreds of NOLAN Feeders in operation.

There are some in your vicinity—ask us to show you how efficient NOLAN equipment can be in your operation.

### NEW FEATURES

- 1. Only 60" longer than the mine car
- 2. Quick change dogs
- 3. No valving or piping used on the track unit
- Dogs operate on close denters for mounting mine car with "V" section draw bar
- 5. Pushbutton control from both sides of leading point with motor control switch
- 6. Removable wear slides
- 7. Automatic Inbrication
- 8. Simple trouble-free valve arrangement on power unit
- 9. Cushion spring anchor and spring cushioned dogs
- 10. Quick positive stroke adjustment

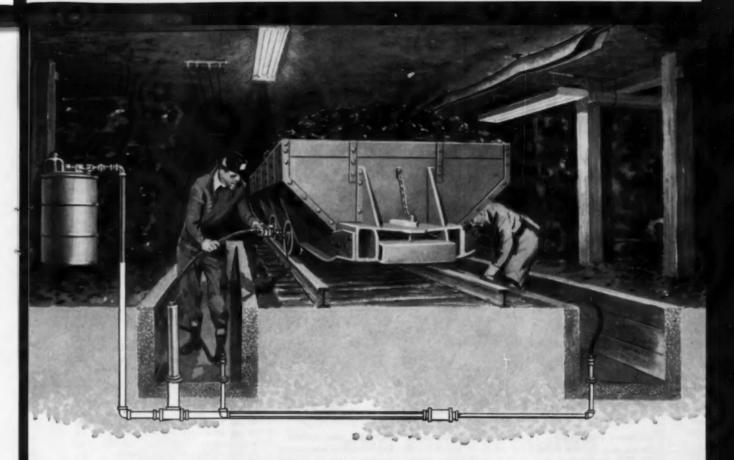


### THE NOLAN COMPANY

Pennsylvania Street • Bowerston, Ohio

**NOLAN SALES AGENTS** 

Saaryo C. Hurchinson, Jr., 1364 Kaanan Bullding, Pittsburgh, Pa Hustington Supply & Equipment Co., Hustington Mai'l Bank Bidg., Hustington, M. Ve. John Lloyd & Sans, 33 Samest Bidg., Wilker-Barra, Pa. E. C. Horres Rightinsey Co., 1728 Champas Street, Durwer Z, Calarude. Frunk C. Memmett, P. G. Sax 154, Carlle Sore, Utub Amoc A. Crip, 429 Sauth 28th Street, Biominghous S, Alnisano John Morth Ameriated, P. G. Bax 165, Hurbert, Michigam (Chicago Botriel)



# Here's a way to help a coal mine show a profit!

Alemite Barrel Pumps cut mine car lubrication time in half —extend bearing life—slash maintenance—boost tonnage!

These two pits, above ground or below, allow mine cars and locomotives to be lubricated almost "on-the-go." Important time savings are the immediate result, but even more important are increased bearing life—the savings in downtime and maintenance! And tonnage goes up because the car stays on the job, where it belongs!

Simplified system pays for itself—FAST! Installation is easy, and savings quickly pay the modest cost. From the Alemite Barrel Pump, lubricant is piped to the two outlets equipped with Alemite Control Valves. Operators have finger-tip control of lubricant where they need it—right at wheel level. Lubricant stays "refinery clean"—free of dust and grit!

The powerful "Heart of the System" is the Alemite Barrel Pump. It has the power to completely flush out old grease and grit. To supply the bearing with fresh, effective lubricant—in seconds! Alemite Barrel Pumps can handle one or many outlets, are available in a wide range of types and sizes to exactly fit your needs.

A trained Alemite engineer will be happy to explain this and other ways modern lubrication methods can save you money—help MAKE you money! And this service is absolutely FREE to you! Simply write Alemite, Dept. N-97, 1850 Diversey Parkway, Chicago 14, Illinois, for FREE information!



**ALEMITE** 

**Lubrication Methods that Cut Maintenance Costs** 

# VICTAULIC® METHOD OF PIPING

### VICTAULIC HAS EVERYTHING ...



### VICTAULIC COUPLINGS

Simple, fast, reliable. Styles 77, 77-D, for standard uses with steel or spiral pipe, — Style 75 for light duty. Other styles for cast iron, plastic and other pipes. Sizes ¾" to 60".



### ROUST-A-BOUT COUPLINGS

For plain or beveled end pipe Style 99. Simple, quick, and strong. Best engineered and most useful plain end coupling made — takes a real "bull-dog" grip on the pipe. Sizes 2" to 12".



### VICTAULIC SNAP-JOINTS

The new, boltless, speed coupling, Style 78. Hinged into one assembly for fast piping hook-up or disassembly. Hand locks for savings in time and money, Ideal for portable lines. Sizes 1" to 8".

### Equipment News (Continued)

sions delivering 12 forward and three reverse speeds. The over-and-under transmission provides two additional speed ranges for each gear ratio of the four-speed transmission. Top speed is 20 mph.

SHAFT-MOUNTED DRIVES — Falk Corp. is producing a new higher ratio (24:1 and 20:1 in two smaller sizes) line of all-steel, double reduction, shaft mounted drives. Outside dimensions and torque ratings, however, remain the same. Practical advantages are said to be 1) the use of smaller sheaves to obtain a given output speed, and 2) a savings in motor cost when, because of the lower output speed, a 1,750-rpm motor can be used instead of a more expensive slower speed motor. The new Falk units are available for horizontal and vertical application, and in 1/2 to 30-hp ranges. Output speeds are as low as 5 rpm. New selection tables can be had on request by writing to the Falk Corp., Dept. 255, 3001 West Canal St., Milwaukee 1, Wis.

BLUEPRINT HOLDER—A space-saving holder for viewing long blueprints (up to 40 ft or more) permits examination of an area approximately 40x48 in on wall, table, desk and tailgate. The holder, made by Aqua Sportsman, Inc., 2518 Leslie Ave., Cincinnati 12, Ohio, is available in two models. Both models handle prints (or maps, photos, drawings, etc.) as scrolls, employing rolls at each end for winding.

ELECTRICIAN'S TAPE—Okoweld tape, a development of the Okonite Co., Passaic, N. J., is designed for splicing and terminating either plastic or rubber cables. For connections operating under 2,000 v the tape serves as both insulation and sheath. Okonite says that although other tapes have been offered for the dual purpose of sheathing and insulating in one operation, its own Okoweld is the first dual purpose material that will fuse into a solid unit.

### COUPLINGS FOR EVERY PIPING JOB



VICTAULIC FULL-FLOW FITTINGS

Elbows, Tees, Reducers, Laterals, a complete line—fit all Victaulic Couplings. Easily installed — top efficiency. Sizes %" to 12".



VIC-GROOVER TOOLS

Time saving, on-the-job grooving tools. Light weight, easy to handle — operate manually or from any power drive. Sizes %" to 8".

### PLUS FITTINGS AND GROOVING TOOLS

"EASIEST WAY TO MAKE ENDS MEET"

Promptly available from distributor stocks coast to coast. Write for NEW Victaulic Catalog-Manual No. A-9

# VICTAULIC COMPANY OF AMERICA P. O. BOX 509 • Elizabeth, N. J.

### Free Bulletins

TORQUE CONVERTERS—Excavator, crane and shovel torque converters manufactured by the National Supply Co., 2 Gateway Ctr., Pittsburgh, Pa., are explained in data sheet No. 101. Within the sheet National explains 12 features of the converters, which are single stage units. Listed are representative types and makes of engines with which the 17 sizes of National converters can be used in the 100- to 1,000 hp range.

FASTENERS SEALANT-Loctite sealant, described by the manufacturer as "the liquid lock for threaded fasteners," is the subject of Technical Report No. 5, a publication of the American Sealants Co., 103 Woodbine St., Hartford 6, Conn. Inside the pages of Technical Report No. 5 are chapters on what

# TIGERWELD BONDS



COAL AGE . September, 1957



Our large inventory enables us to promptly fill your requirements for dependable, accurate and quality replacement parts for all types of mining machinery. Call, write or wire us for parts you need in a hurry.



### PENN MACHINE CO.

JOHNSTOWN, PA.

Union Trust Bidg., Pittsburgh, Pa.

Hantington, W. Va.

### Equipment News (Continued)

the sealant is, the strength of joints sealed with Loctite, and how to lock threaded fasteners.

RELAY TEST INSTRUMENTS—The Multi-Amp Corp., 465 Lehigh Ave., Box 217, Union, N.J., is distributing a 5-p folder on a new line of relay test instruments. The new line consists of five models that are said to be compact enough to save 75% of the set-up time usually required for relay testing.

EXCAVATION HISTORIES—The Explosives Dept of American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y., is distributing a brochure outlining current information on drilling, blasting and excavating methods used in stripping. The brochure, "Stripping Case Histories," lists 46 detailed stripping case studies in chart form. Information is categorized under 16 headings. e.g. geological formations, coal seam thickness, drilling equipment, bit performance, explosives ratios.

AIR TOOL TROUBLE CHART— An 8-p bulletin entitled "I Know Airpower" is being sent on request by Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis., to explain troubles encountered with rock drills. The bulletin, AT-116B, contains a "trouble-shooting chart" and applications of air as power.

PREPARATION PLANTS-The most recent coal preparation plants engineered by the Link-Belt Co. are featured in Book 2655, a publication of the company. Link-Belt says it has prepared the book because coal demands are more exacting, quality deposits are on the decrease, labor costs are mounting and competition from other fuels is rising. Thus, the newest and most efficient preparation equipment manufactured by Link-Belt has been included in the book's contents. Under one section, for example, the company has included unloading and handling facilities, cleaning, classifying and conveying methods, crushing, blending, thermal drying, water clarification, loading and replacement units. A detailed description of how each component fits into an up-to-date operation accompanies photographs of each. Also described are the latest Link-Belt dual-bed air pulsated wash box, the new tank-type heavy media vessels, modern car dumpers, and related equip-ment. Copies of the book are available from Link-Belt Co., Dept. PR, Pruden-tial Plaza, Chicago 1, Ill

PREPARATION EQUIPMENT—A general equipment bulletin (No. G3-B60) published by the Denver Equipment Co., 1416 17th St., Denver 17, Colo., contains pictures and text of the company's latest equipment for mining processing. Included are agitators, classifiers, crushers, dryers, feeders, reclamation systems, agitator type disc filter, floation units, jigs and pumps. Text contains sizes, capacities, dimensions and horsepower. In

### The trend is to Wheat ...

# the WHEAT FORTY-NINER

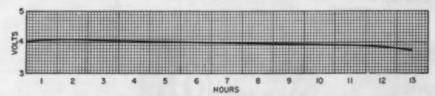
**Electric Cap Lamp** 

- Full Shift Performance
- Automatic Charging
- Minimum Maintenance

In the Wheat "Forty-Niner," the mining industry is offered an ideal combination of high-standard lighting and exceptionally low-cost maintenance. Wheat Electric Cap Lamps provide a very high percentage of initial illumination right through the full shift (see chart), and require no maintenance beyond ordinary cleanliness, weekly watering and occasional bulb replacement. Development of the Wheat Automatic Steel Charging Rack with its electronically-controlled, selenium-disc rectification makes possible further savings through fully automatic operation.



Proof of Wheat Performance



See how the Wheat "Forty-Niner" maintains a high percentage of initial light efficiency right through the end of the shift! The chart clearly shows how the "Forty-Niner" maintains its light output at high levels during and beyond the entire

working period. This is graphic proof of Wheat efficiency in battery design and construction.

Check these and other advantages of the Wheat "Forty-Niner" in the Wheat Bulletin. Write for your copy today!



#### National Mine Service Company

564 Alcoa Building . Pittsburgh 19, Pennsylvania

All-State Division Logan, W. Va. Kentucky-Virginia Division Western Kentucky Division Whiteman Division Jenkins, Ky. Madisonville, Ky. Indiana, Pa.

Anthracite Division Forty Fort, Pa.

Ashland Division Bemeco Division

Ashland, Ky. Beckley, W. Va.

Clarkson Division Nashville, III. untaineer Division organtown, W. Va.



Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill. Operated by the compressed air it cleans, the "Aridifier" removes oil, moisture, dirt and scale by an application of centrifugal force.

EXPANSION ANCHORS—The J. D. Polis Mfg. Co. is distributing a 6-p catalog showing the company's complete line of "Bulldog" expansion anchors and pin bolt drives. Five types of self drilling anchors for use in concrete are catalogued. The catalog, No. 57, also contains details on pin bolt drives for use in brick, concrete, tile, wood, and most masonry block. Address: 2900 W. 26th St., Dept. A98, Chicago 23, Ill

INDUSTRIAL TIRES—The B. F. Goodrich line of industrial tires is described in detail in a new 36-p illustrated guidebook published by the company. In addition to specifications the book explains 1) uses of types of tires; 2) the variations in pneumatic tire capacities at various speeds; 3) and how to change steel wheels to rubber tire-equipped wheels in three steps. Address: B. F. Goodrich Tire Co., Akron, Ohio.

DITCHER—The Gar Wood 403 utility ditcher is explained with text and photographs in a new catalog being offered by Gar Wood Industries, Inc., Wayne, Mich. Action photographs show the ladder-type ditcher at work under a varied number of conditions. Gar Wood's Customer Service Dept. is distributing the catalog.

BUCKETS AND HOPPERS—Penn Iron Works, Inc., Reading, Pa., has issued a 4-p bulletin showing a variety of sidedump and bottom-dump buckets and hoppers. Ten different types of buckets are illustrated, although Penn makes hundreds of designs.

DRILLING—The Stardrill-Keystone Co., Beaver Falls, Pa., is distributing on request a 164-p catalogue covering all the products the company manufactures. The title of the book is Drilling Holes. Its product and application information covers hole drilling from 1 in to 60 in to 3,000 ft "by the six basic methods in all underground formations." Some of the topics: percussion and combination machines, rotary machines, percussion and rotary tools, reverse circulation, hydraulic bit dressing equipment, field procedures for drilling, tool dressing, tempering and handling. The book is being published in celebration of the company's 75th anniversary. Copies from H. J. Allen, Stardrill-Keystone Co., Beaver Falls, Pa.

MINING TOOLS—Firth Sterling, Inc. has announced a new catalog of its mining tool line. Descriptions, dimensions and style numbers of Firthite mining machine bits, roof bits, drill bits, finger bits, and drill bit inserts are included. One section introduces Firthite percussion rock bit inserts, and provides technical data on percussion drilling grades.



NATIONAL MADLEAPLE CASTINGS COMPANY

Established 1868

Cleveland 6, Ohio

COAL AGE

## **News Roundup**

#### Italian Steel Group Hauling Own Coal

The first ship of a six-vessel Italian bulk cargo fleet being built to carry 1.5 million tons of coking coal annually from the United States to Italy sailed from Norfolk, Va., last month.

The ship, the M/S Acciaiere, was

constructed by Italy's biggest steel-making combine, Societa Finanziaria Siderurgica Finsider, which is building six ships and chartering six more to stabilize the total price it pays for American coal.

In Norfolk, during a luncheon wel-coming the Acciaiere, Raoul Ferreri, executive vice president and United States representative of Finsider, disclosed long range company plans to increase steel production more than 50% by 1965.
"Our need of coal," Mr. Ferreri said,

"will therefore increase accordingly, and by the year 1965 we will have a capacity for producing at least 2.3 million

retric tons of pig iron yearly."

Finsider, which is composed of two steel companies—Ilva, Alti Forni Acciaiere d'Italia, and Cornigliano, S.p.A., currently consumes 1.5 million tons of coal a year. Approximately 90% of it is purchased in the United States. "These plants," Mr. Ferreri said, "produce 80% of Italy's pig iron and 52% of her crude steel. They are looking permanently to the American coal market for their supply of essential coking coal."
"At this moment," he told the lunch-

eon audience, "there are two large new blast furnaces under construction in two of Ilva's plants, a third one will be erected to integrate one of the plants of our pipe manufacturer, Dalmine, a fourth one will be built at Cornigliano and an entirely new plant for the production of 500,000 metric tons of steel will be built in the south of Italy at Taranto.

At the ship-welcoming luncheon were United States coal, shipping and railroad executives, representatives of the State and Commerce Depts., the Maritime Commission, the International Cooperation Administration, the Italian Embassy and Hampton Roads organizations.

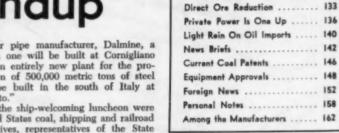
The M/S Acciaiere is one of four sister ships of 16,000 deadweight tons. Finsider is also constructing two vessels of 19,000 deadweight tons. All six ships, including six more under time charter, will be operated by Finsider's own shipping company, Sidermar, S.p.A.,

Finsider's first shipment of coal-the cargo picked up by the Acciaiere from the Virginia Ry. piers at Norfolk's Sewells Point-was supplied by Castner, Curran & Bullitt, Inc., the New York export coal sales subsidiary of Eastern Gas & Fuel Associates.

#### Harris Gas Bill Waits Off-Stage

The Harris gas bill was waiting off stage in the House of Representatives last month after Sam Rayburn, speaker of the house, said that action would be postponed until 1958 because House members were too "unstrung" to tackle the controversial measure.

Speaker Rayburn, a Texas Democrat who favors the legislation to relax federal controls over natural gas producers,



said that Congress had been in session for more than 7 mo and the nerves of its members were strained.

In This Section

Preparation Facilities ...... 128

However, unofficial information sources and published comments support the contention that the bill's proponents weren't able to muster the votes to pass

The bill is substantially the same bill introduced by Rep. Oren Harris (D-Ark.). Its principal provision is to treat gas as a commodity and permit produc-ers to charge the going field price rather than use the utility type (cost plus a fair return) yardstick.

Coal's battle against the bill has been centered around the fear that belowcost dumping would occur during sea-sonal lulls in residential gas demand. Industry spokesmen have maintained that dumping gas at below cost would saddle other fuels industries with unfair competition. They maintain, too, that interstate pipelines are common carriers and should be subjected to the same type of regulation imposed upon rails other interstate movement. Coal sales representatives say that natural gas holds a monopoly by the very nature of its distributive pipeline system and that gas should be required "to shoulder public responsibility."

#### Rails Prepare Anew For Rate Increase

More than merely dissatisfied with the 4% to 7% freight rate increase they were granted last month, the nation's railroads this month were preparing to

bid for another rate boost.

Already huddling in August "before the ink was dry" on the decision of the Interstate Commerce Commission to raise rates, the roads were loudly vocal and open in their complaint that the increase would not give them the 6% investment return they want.

Despite this, however, they weren't planning to use the point of a fair investment return in any new argument being prepared for filing with the ICC. The ICC, when it granted last month's rate raise, had rejected an eastern and western rails' plea for higher rates to improve the railroads' financial position.

Thus, the new arguments, when they are filed with the agency, will be based on higher costs. Rails will say they are faced with a 10% rise in the payroll tax rate to pay an increase in employee



M/S ACCIAIERE, first vessel of the new Finsider fleet, was built by Italian steelmaking combine. The fleet will shuttle between U. S. and Italy with cargoes of metallurgical coke. Acciaiere can carry 16,000 tons.

## COAL MINING DIESEL LUBRICATION GUIDE ≅ CITIES △ SERVICE

#### WHAT CAUSES LUBRICATION FAILURES?



The biggest single reason for lubrication failure is improper selection and application of

Today's lubricating oils are made for highly specialized purposes. The fact that an oil

seems ideal for the requirements of one piece of equipment is no guarantee of its qualifications for other machinery.

For example, choice of an oil with low detergency may result in stuck rings, excess cylinder wear, injector clogging, bearing wear and other diesel difficulties.

Next time you're considering what type of oil to use for a certain piece of equipment, call in a Cities Service Lubrication Engineer. He not only has the precise oil for the particular unit you want to lubricate, but may be able to simplify your entire lubrication picture and reduce maintenance costs as well.

#### **USERS ACCLAIM CITIES SERVICE C-300 OIL**

From a strip miner comes this report: "Shovel and dragline work 20 hrs. a day, seven days a week. Each have rolled up over 14,000 hrs. with no major overhaul, using Cities Service C-300 Motor Oil."

From a leading stone company: "Our six stationary diesels, powering our compressors and crushers, have averaged 12,000 hours each before major overhaul, with Cities Service C-300 Oil."

From a trucking company: "Our 20

diesels get up to 225,000 miles before overhaul with Cities Service C-300 Oil. We don't even grind the valves before then.'

With excellent oxidation resistance, high detergency, and low carbon residue, Cities Service C-300 Oil may be the perfect lubricant for your machinery, too.

Get the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.





#### USING A SULPHUROUS FUEL? TRY THIS NEW CITIES SERVICE OIL

If you're using a diesel fuel with high sulphur content, your motor oil must do more than its normal share of work to fight engine deposits.

Cities Service C-100 Motor Oil has been formulated for just this purpose. Under dusty, dirty, and sulphurous conditions, it provides excellent engine lubrication and protection. Talk with your Cities Service Lubrication Engineer for details.

#### MAN YOU SHOULD



Regional Manager of Industrial Oil Sales at

the Cities Service office in St. Paul, Minnesota. With a background of 35 years as a lubrication engineer and a talent for solving problems, he is typical of the Cities Service engineering staff that's at your service. A call to the nearest Cities Service office will bring a member of this staff to your plant or job site.

retirement benefits, an increase enacted into law last year by Congress. To this will be added the argument

To this will be added the argument that a wage increase will have to be granted November 1 to keep wages in line with the rising cost-of-living index.

And, rails will argue further that all signs point to increased costs for materials.

The new approach, in fact will follow a line suggested by the ICC itself when it told the carriers to go looking for rate increases only when higher costs become an actuality. This is exactly what the carriers intend to do; and when they do it they will cite figures, chapter and verse.

Last month's increases were much lower than those asked by the railroads. The ICC granted eastern and western roads a 7% rise, southern roads 4%. In addition, it permitted the carriers to make permanent the interim increases granted early this year and late last year (7% in the east, 5% in the west and 5% in the south).

Generally, the carriers found themselves with permission to raise freight rates a total of 14% in the east, 12% in the west and 9% in the south. They had sought increases totaling (including the interim increase) 22% in the east and west, and 15% in the south.

Coal, however, was one of several specified exceptions. The ICC said it would permit a flat increase of 15c a net ton, on any all-rail movements, 10c on export coal, and 7c on lignite. The flat 15c increase also applies on so-called lake cargo coal with a subsequent movement beyond the first port to or by way of a port other than those situated on Lake Superior and Lake Michigan. Otherwise, on coal and coke moving by rail and water the increase in the rail



ROBENA MINE TEAM 2 was first place winner of Southwestern Pennsylvania Safety Association First Aid Meet, Waynesburg, Pa. Front: Louis Kopec (left), John Chambers, who captained the team, Andrew L. Hatalla, George Yurkyuric. Second row: Peter Dragish UMWA representative, George Raitay, Jr., William E. Lee, Joe Simon, instructor, H. R. Johnson district manager of Mine Safety Appliances Co. Team member Robert J. Monoghan was not present for photo.

factor can not exceed 8c a net ton to a port when re-shipped beyond that port. When coal is moved by rail-waterrail routes the increase in the rail factors will not exceed 8c a net ton from the mine to the first port and 7c from the second port to the coal's destination. When moving via water and rail routes the increase for rail transportation will not exceed 8c.

#### Robena Mine Team First At Aid Meet

U. S. Steel Corp.'s Robena mine team No. 2, scoring 99.667 points, was awarded first place prizes August 17 at the Southwestern Pennsylvania Safety Association's first aid meet held in Waynesburg, Pa. The team, which was

#### **Preparation Facilities**

Island Creek Coal Co., Mine 28, Verdunville, W. Va.—Contract closed with the Deister Concentrator Co., Inc., for six Conceneo No. 77 diagonal deck washing tables, and for one Model 108 feed distributor.

Harlan Fuel Co., Yancey, Ky.— Contract closed with the Deister Concentrator Co., Inc., for three Concenco No. 77 diagonal deck washing tables.

Pocahontas Fuel Co., Inc., Itmann mine, Itmann, W. Va.—Contract closed with the Deister Concentrator Co., Inc., for one Concenco No. 77 diagonal deck washing table.

Peerless Coal & Coke Co., Kimball, W. Va.—Contract closed with the Deister Concentrator Co., Inc., for one Concenco No. 77 diagonal deck washing table.

American Coal Co. of Allegany Co., Deerfield Colliery, Deerfield, W. Va. -Contract closed with the Deister Concentrator Co., Inc., for two Concenco No. 77 diagonal deck washing tables. Rosini Coal Co., Shamokin, Pa.— Contract closed with the Deister Concentrator Co., Inc., for one Concenco two-way splitter for splitting feed to the twin decks of a No. 77 diagonal deck washing table.

Boone County Coal Corp., Sharples, W. Va.—Contract closed with the Kanawha Mfg. Co. for a coal storage system consisting of an extension to the existing mine belt conveyor and two 200-ton circular storage bins with motorized truck loading gates.

Eastern Gas & Fuel Associates, Wharton, W. Va.—Contract closed with the Kanawha Mfg. Co. for a Deister table plant consisting of six double deck Concenco tables to clean 4x0 at 120 tph.

Slab Fork Coal Co., Mary Gaston, W. Va.—Contract closed with the Kanawha Mfg. Co. for a preparation plant consisting of a Jeffrey diaphragm jig, dewatering and classifying equipment, two Reineveld centrifugal dryers, and facilities for rail loading. Capacity, 250 tph.

Lorado Coal Mining Co., Lorado, W. Va.—Contract closed with the Kanawha Mfg. Co. for a water clarification and fine coal recovery circuit consisting of Heyl and Patterson cyclones, five 14-in cones and five manifolds of 3-in cones. The circuit's design will accept the future installation of a vacuum filter.

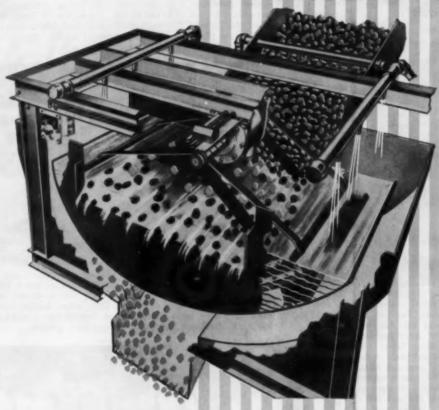
Clinchfield Coal Co., Tiller plant, Dante, W. Va.—Contract closed with the Eimco Corp. for filtration equipment consisting of five Agidisc filters (three clean coal filters, two refuse filters).

Utility Coal Co. Mine, Marion, Ill.— Contract closed with the Daniels Co., Contractors, Ine., for a complete new preparation plant including a DMS dense media precision coal washer to wash 7x½ rom. Overall capacity 275 tph. Scheduled completion, January, 1958. WILMOT'S



HEAVY - MEDIA SEPARATION

VESSELS.



#### CUT PRODUCTION COSTS

by offering operating simplicity and minimum maintenance requirements throughout your entire processing schedule.

Available in several sizes Wilmot-OCC H-M Vessels accommodate individual installation requirements either as replacement units or as parts of newly designed Heavy Media Systems.

For complete information send for bulletins giving general descriptive information of all Wilmot Coal Preparation Equipment.

#### WILMOT ENGINEERING CO.

HUNTINGTON, W. VA.: PO Box 1831, Phone JAckson 5 2571

WHITE HAVEN, PA.

Exec. Offices

HAZLETON, PA.



led by John Chambers, was awarded \$210, a plaque from Mine Safety Appliances Co. and individual trophies from the United Mine Workers.

Second place was won by Robena's preparation plant team, which posted a score of 99.467. Led by Guerino Shannon, captain, the team was awarded \$175.

Third place went to the Crucible mine team No. 1, Crucible Steel Co. of America. Awarded 99.333 points by the meet's judges, the Crucible team was presented with \$140. Its captain was Marion Haligowski.

#### Hutchinson Mine Tops Aid Teams

Pittsburgh Coal Co.'s Hutchinson mine, led by Nick Maruschak, captain, scored 99.800 points at the Westmoreland County Safety Association first aid meet in Latrobe, Pa., August 17.

The Hutchinson team was awarded a Mine Safety Appliances Co. plaque and

Second place was won by a team from Loyal mine, Wyatt Seanor Coal Co. The team accumulated 99.333 points and was captained by George Cindric. Second place prizes were \$175 and a National Coal Association award.

No. 10 mine, Delmont Fuel Co., was third with 99.067 points and was presented with a UMWA plaque and \$140. The team's captain was John Perbonish.

#### R&P Lucerne Mine Wins Safety Meet

The Lucerne mine, Rochester & Pittsburgh Coal Co., won Pennsylvania's North Central District Safety Association first aid meet at Indiana, Pa. Led by George Turley, captain, the Lucerne team attained a 99.133% score and was awarded \$350 and a Mine Safety Appliances Co. plaque. Second place at the meet was won by the Conemaugh mine, Conemaugh Mining Co., which scored 98.533% led by Mike Rocker. The second place award was \$210 and a UMWA trophy. The next three places went to 1) the Ernest mine, Rochester & Pittsburgh Coal Co., which scored 98.200% and was led by Richard Patterson; 2) the Keystone mine, Imperial Coal Corp., which posted 97.801% led by Albert T. Barr; and 3) the Kent 2A mine, Rochester & Pittsburgh Coal Co., which scored 97.800% and was captained by W. W. Thompson.

#### Semet-Solvay Team Wins First Aid Meet

Eastern Gas & Fuel Associates' Semet-Solvay team, Harewood, W. Va., won first place honors and prizes in the Fayette-Raleigh-Wyoming First Aid Meet in Beckley July 20. Second place was won by a team from Armoo Steel Corp.'s Montcoal, W. Va. mine. The Minden



HUTCHINSON MINE, Pittsburgh Coal Co., won first place at the Westmoreland County Safety Association First Aid Meet in Latrobe, Pa., August 17. Team members are: Andrew Gedman (left), Daniel Laughner, Kenneth Kohl, Nick Maruschak, captain, Thomas Blandford, Lewis Cecchett Warner, Mike Fraicola, Aldren Taylor, C. W. Parisi, safety director.



LUCERNE MINE FIRST AID TEAM, which placed first in the North Central District Safety Association first aid meet, Indiana, Pa., was awarded \$350 and MSA plaque. In the front row are Harold Everett (left), George Turley (captain), Everett White, who is manager of the Mining Div., Mine Safety Appliances, Donald Harris, and C. C. Larsen, mine superintendent. Second row: James Loughner (left), Steve Harshyne, William Seese and John Kenosh.



SEMET-SOLVAY TEAM from Harewood, W. Va., was first in the recent Fayette-Raleigh-Wyoming First Aid Meet held in Beckley, W. Va. In picture are Joe Mulligan (standing, left), mine safety director; Henry Carter, Mine Safety Appliances Co.; Beecher Denny, captain of the aid team; Allen E. Akers and King H. Ward, team members; Crawford L. Wilson, chief of the West Virginia Dept. of Mines; Cecil Hunt, mine superintendent; and Joshua Smith, director of the aid meet. Kneeling are Carl Peters (left), Lawrence Weaver, James Criniti and Sam King, team members.

# HOLD EVERYTHING!

**BIG NEW SERIES E TRAXCAVATORS\*** 



The tough reliability of the No. 955 and No. 977 has already been field-proved. In the new Series E, these Cat-built Traxcavators give even greater performance in applications that put top stress on the guts of your equipment.

These CAT\* Series E Traxcavators come equipped with a new heavy-duty, extra-sturdy undercarriage for longer life, lower maintenance costs, and better job production when the going is really bad.

You get-

New heavier idlers
New solid sprockets
New and tougher track rollers with frames and
guard of heavier construction
More ground clearance
Lower center of gravity for better handling
and more stability

Lower transmission speeds for more bucking power

No change in the maneuverability, big capacity and always dependable power of these great machines, of course.

For all the details on this improved Traxcavator line, phone your Caterpillar Dealer same man you call for expert service and replacement parts that don't let you down.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR\*





#### Okocord Red Saddle shuttle car cable is the answer to:

# constant flexing • run-overs • abrasion pulling • twisting

Conditions in individual mines vary. But you can be sure that you have a shuttle car cable that will resist all of these difficulties if yours is Okocord Red Saddle shuttle car cable (with Hex-Tite construction, of course).

The Red Saddle is a pre-formed neoprene protective wall which assures a uniformly thick fill between conductors . . . gives added security against short-circuiting during run-overs.

What's more, there's no danger of internal slipping or rotation with Hex-Tite construction. For the insulation of each conductor is hexagonally shaped to provide six plane surfaces which lock with the Red Saddle and Okoprene sheath. Bonding between all elements is assured by a special adhesive.

Naturally, the Okoprene sheath is tough, highly flexible and is unaffected by oils, acids, alkalies and mine water.

These features—plus others such as the heavy reinforcing cords embedded in both insulation and sheath as a further guard against pulling damage—are all good reasons why we believe Okocord Red Saddle, using the Hex-Tite construction, is your best buy in shuttle car cable.

You'll find complete information about this rugged construction in Bulletin CA-450. Write today for your copy to The Okonite Company, Passaic, N. J.

4774



where there's electrical power...there's OKONITE CABLE

team, representing the New River and Pocahontas Consolidated Coal Co., was third.

In the guest division an Imperial Smokeless Coal Co. team from Quinwood was first in a field of eight.

The Fayette-Raleigh-Wyoming meet was host to 33 teams, the largest number to meet in Beckley, W. Va. since 1941.

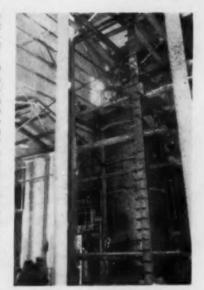
#### Koal Krudes Plant Goes on Stream

Char and by-products production was scheduled to start in August at the new plant of Koal Krudes, Inc., Red Lodge, Mont., at which time the first of two retorts included in the initial construction phase was expected to go on stream. The plant is designed to accommodate a total of six retorts ultimately.

Major products are char, which will find its principal market in electricfurnace production of phosphorus and in coasting and nonferrous-metal smelting; tar, as an admixture in the preparation of roofing compounds; light oils; and creosote. The latter, in short supply in the area, will be the principal product. At the ideal split, the value of the by-products is calculated at \$7.80 per ton of coal.

Some of the coal to be used is 11/2x0 washed slack from the No. 4 vein operated by the Brophy Coal Co. Additional coal will come from the Smith mine operated by Sam Carpenter. The average ash is 7%, compared to the contract limit of 9%. Minimum capacity is estimated at approximately 20 tons per retort per day, and is expected to be substantially higher. The charring temperature is 1,200 to 1,300 F, and heat is supplied by gas generated in the retorting. In addition to gas, the product yield per ton of coal charged is expected to be 1.150 lb of 4% volatile char, 21/2 gal of tar and 20 gal of creosote and light oil.

The char units are a development of the Hobson patents by the PDP Processing Co., of Spokane, of which Koal Krudes is a subsidiary. Part of the capital for the plant was provided by Red Lodge citizens and business concerns. Research to develop the best design of retort was carried out at Montana State College



FIRST OF SIX, the retort above is the heart of the new Koal Krudes plant, set up to produce char, tar, creosote and light oils from Wyoming's Red Lodge area coal.

with the assistance of a \$40,000 legislative grant. An experimental retort was operated continuously for 7 mo starting in October, 1955, and intermittently thereafter testing all Montana coals and some from other states. This resulted in a decision to base the plant on Red Lodge coal.



KOAL KRUDES PLANT at Red Lodge, Mont., was scheduled to begin producing char and by-products in August. Two retorts are included in initial construction phase, one going on stream now. The plant is designed to accommodate six retorts.

#### Direct Reduction Nearly Commercial

Two methods of direct reduction of iron ore, methods which would eliminate the blast furnace and its supporting coke ovens, are reportedly near the commercialization phase.

The two methods are 1) the H-iron process, a development of the Bethlehem Steel Co. and Hydrocarbon Research, Inc., and 2) the R-N cycle, a development of Republic Steel Corp. and National Lead Co.

Both processes are attractive to steelmakers in two ways;

 They would eliminate the very high capital cost of blast furnaces and coke ovens for conventional iron smelting by as much as 50%.

2) They would permit steelmakers to be independent of the scrap metal market, a market which provides steel with 55% of its annual ingot tonnage at unpredictable prices. The processes produce synthetic scrap which could take the place of purchased scrap. An added attraction is that the pro-

An added attraction is that the processes would permit the steel industry to use the electric furnace for making steel, since the super-refining electric furnace depends on scrap more than the open hearth.

The R-N cycle, a development of the R-N Corp. (Republic Steel and National



BUILDERS AND SUPPLIERS—Dr. Lloyd Berg (left) and D. E. Atkinson, in charge of plant construction; and James R. Brophy, president, Brophy Coal Co.

Lead) employs a rotary kiln and a lowgrade carbonaceous fuel to remove oxygen from pulverized iron ore at the high temperature of 1,900 deg, the fusion point of iron. Carbon Monoxide is the reducing agent. Then the iron is drawn over a magnetic separator, which rejects such impurities as silicates. Finally the iron powder is made into briquets containing 85% to 95% iron. The R-N cycle reportedly produces the equivalent of No. 1 heavy melting scrap from low grade ores.

The H-iron process (Bethlehem Steel and Hydrocarbon Research) requires high grade ores, which are finely powdered. Oxygen is removed from them at the relatively low temperature of 900 deg and under 400 psi pressure. The key to the H-iron process is low-cost hydrogen, which is used as the reducing agent. Hydrocarbon Research says that it can generate hydrogen from common inexpensive fuels at costs lower than those for coke.

For coal operators the news that direct reduction was approaching a commercial phase meant problems ahead with a customer that had long been regarded as an industry bulwark.

The problems however did not include the loss of a customer nor even an immediate change in the customer's needs. What it did mean was that a gradual change in the needs of steel have to be reckoned with by coal, since both processes require low-cost reducing agents—hydrogen and carbon moxoxide—and both can be produced by utilizing coal. Thus, coal's gasification research programs in recent years seemed to point the way.



FIRST AID MEET WINNERS—Judged perfect at the Central Pennsylvania Safety Association first aid meet in Hastings, Pa., the Cardiff No. 1 mine team of the Imperial Cardiff Coal Co. won first place honors among a field of 11 entries. For their perfect effort the men were awarded \$350 and a plaque from Mine Safety Appliances Co. In the first row are Michael Black (left), Joseph Crawford, Herbert Strum (captain), Scott Fuller and V. A. Stanton. Mr. Stanton is district manager of MSA and presented the company's plaque. Standing are Paul Ludwig (left), John Pabrazinsky, William Black, Matt Jarvie (safety director) and W. H. Berkstresser (mine foreman).

#### Cardiff No. 1 Posts Perfect Aid Score

Captained by Herbert Strum, the Cardiff No. 1 mine safety team, Imperial Cardiff Coal Co., Nettleton, Pa., captured first place at the Central Pennsylvania Safety Association first aid meet at Hastings, Pa.

The Cardiff team was perfect, according to the meet's judges, who rated it at 100%, or the highest possible score. For its perfect effort the team received \$350 and a plaque from the Mine Safety Appliances Co.

Just behind Cardiff was the Beaver Run mine team, Johnstown Coal & Coke Co., with a score of 99.800%. Joseph Kreutzberger captained the men, who were awarded \$175 and a National Coal Association trophy.

The remaining places were won in this order:

Third place—Maryland No. 2 mine, Berwind-White Coal Co.; score 99.300; captain, Steve Gavlack; award, \$140 and UMWA trophy.

Fourth place—Windber mines, Berwind-White Coal Co.; score 98.800; captain, John Boblick; award, flashlights by the Pennsylvania Dept. of Mines & Mineral Industries.

Fifth place—Bird No. 2 mine, Bird Coal Co.; score 98.650; captain, Warren Lewis.

Sixth place—Colver mine, Eastern Gas & Fuel Associates; score, 98.550; captain, Paul Componation.

Seventh place—Rich Hill No. 4 mine, Rich Hill Coal Mining Corp.; score, 98.400; captain, John B. Milchalk.

Eighth place—No. 72 mine, Bethlehem Mines Corp.; score, 98.350; captain, James McTavish.

Ninth place—Maryland No. 1 mine, Berwind-White Coal; score, 98.201; captain, Harry Lingenfelter.

Tenth place—Penn Texas Corp., Pennsylvania Coal & Coke; score, 98.200; captain, Warren Good.

Eleventh place—No. 31 mine, Bethlehem Mines Corp.; score, 98.050; captain, Illo Bartoletti.



NO LOST TIME AWARD—For operating from February 25, 1956 to October 18, 1956 without a lost time accident the No. 9 mine of the Old Ben Coal Corp., West Frankfort, Ill., was awarded the Joseph A. Holmes Safety Association certificate of honor. The mine produced 1,127,246 tons of coal during the period. At the awards ceremony in Illinois' Franklin County Country Club above, are J. A. Connor (left, standing), assistant supervisor, U. S. Bureau of Mines, Vincennes, Ind.; Byrd Rich, president of Local 8317,

United Mine Workers; Ted Mitchell, president, sub-district 5, UMWA; George Stachura, superintendent of No. 9; Paul Tisdale, safety engineer, Old Ben Coal Corp.; Howard Lewis, vice president in charge of operations, Old Ben Coal Corp.; and William C. Campbell, assistant vice president in charge of operations, Old Ben Coal Corp. Seated are H. C. Herrin (left), mine manager, second shift, No. 9 mine; and John Sharkness, mine manager, first shift, No.



At Steep Rock Lake, Ontario, dredge pumps lined with Lukens "T-1" steel (321 min. Brinell) remove two million cu. yds. per month.

#### Rock, Gravel Crash Through World's Most Powerful Dredges; Lukens "T-1" Steel Adds 33% to Liner Life!



Dewatering of this Canadian lake by Caland Ore Company, Ltd., will permit open-pit mining of hematite ore.

In dredging operations, impact and abrasion combine with brutal force to give pump liners expensive beatings. In the world's most powerful dredges, Lukens "T-1" steel now slashes this expense for Construction Aggregates Corp., agents for Caland Ore Co., Ltd.

With order after order, Lukens "T-1" steel is lasting 33% longer than the abrasion resistant steel formerly used.

Whether you handle stone, coal, or metal ores, Lukens "T-1" steel used in the areas hardest hit by punishing abrasive impact will save you money, too. It has tripled the life of rock driers. The 321 minimum Brinell quality has been known to outlast previous metals by 18 to 1 in quarry wear plates.

Chutes, hoppers, and mine cars are other typical applications.

And Lukens "T-1" steel retains its remarkable combination of hardness and toughness at temperatures well below zero. Send for our informative, illustrated booklet, "Lukens T-1' Steel." Write Manager, Marketing Service, Room 961, Lukens Steel Company, Coatesville,

Pennsylvania.





Helping industry choose steels that fit the job



are grease type lubricants especially formulated for use in bearings and on other machine parts subject to heavy loads. Have extremely high film strength, marked adhesiveness and water repellence.

#### LUBRIPLATE Nos. 4 and 8

are most satisfactory fluid type lubricants over a wide range of temperatures. Due to their high film strength, they are ideal for use where heavy loads are encountered.

# REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest Lubriplate distributor see Classified Telephone Directory. Write for free "Lubriplate Data Book"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.



#### ATOMIC PLANTS

# Private Power One Up On Public Power – But It's Temporary

The congressional economy wave, politics, and clashing philosophies all have had their effect this year on atomic power plant legislation passed by Congress. Stripped down to fundamentals the issue has been largely one of the Democrats trying to force the administration to undertake a program of government nuclear power reactor construction and the Administration fighting against such a

The outcome has been a compromise favoring the Administration point of view this year but the Democratic point of view in future years.

This year, for instance, the Democrats were forced to back down considerably on their original demands for federal reactor construction. However, they succeeded in amending the Atomic Energy Act of 1954 in such a manner that all future atomic power projects in which AEC financial assistance is required will be subject to congressional review and approval. This means that every year henceforth when AEC comes to Congress for appropriations, Democrats if they are in the majority, have the means of trying to enforce their demands for federal construction of atomic power plants on AEC with the threat of blocking appropriations.

Here's what happened this year:

In terms of the amended Atomic Energy Act, AEC was required to come before Congress with justification for the \$129 million it wanted for the civilian atomic power program. This money represented largely research and development assistance on power projects authorized or about to be authorized by the commission.

The Democratic majority on the Joint Committee on Atomic Energy succeeded in inserting in the legislation the requirement that AEC undertake construction of three nuclear reactors. These were:

 A \$40 million natural uranium, gascooled reactor of 40,000-kw capacity. This unit would be constructed at Arco, Idaho.

2. A \$15 million plutonium recycle reactor of 15,000-kw capacity to be built at Hanford, Wash.

3. Development, design and engineering studies on a plutonium-producing reactor which may also be used for the production of electric power. The size and cost of this unit has not been specified but the joint committee allowed \$3 million for the preliminary work.

These three reactors are the major part of the Democratic program. Originally, the money to start this program totaled \$58 million. In conference between the Senate and House this figure was trimmed down to \$21 million. Later it was trimmed again—this time to \$10 million.

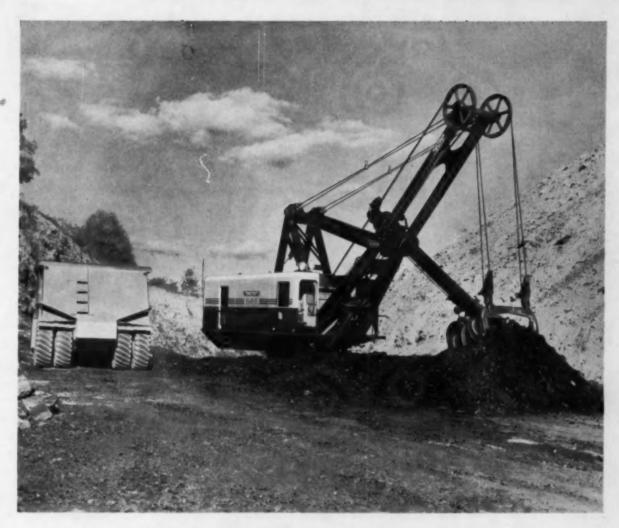
In 1956, it will be recalled, the Democrats were trying to get through Congress the Gore bill which called for a \$400

#### Electric Utilities that are Building or Planning to Build Atomic Power Plants

Name	Location	Elec. kw	Start- up
BEING BUILT:			
Pacific Gas & Electric CoGeneral Electric Co	Pleasanton, Cal.	5,000	1957
Duqueane Light Co.—AEC	Shipping Port, Pa.	60,000	1957
Commonwealth Edison Co. Group	Near Joliet, Ill.	180,000	1960
Consolidated Edison Co., N. Y	Indian Point, N. Y.	275,000	1960
Power Reactor Development Co	Monroe, Mich.	100,000	1960
PLANNED:			
Rural Cooperative Power Association*	Elk River, Minn.	22,000	1959
Yankee Atomic Electric Co	Howe, Mass.	134,000	1960
Wolverine Electric Cooperative®	Hersey, Mich.	10,000	1961
Consumers Public Power District	Beatrice, Neb.	75,000	1962
Florida Nuclear Power Group	Florida	136,000	1962
Northern States Power Co. Group	Minnesota	66,000	1962
Pennsylvania Power & Light Co	Eastern, Pennsylvania	150,000	1962
West Penn Group, Reactor No. 1	Ohio Valley	13,000	1962
New England Electric System	New England	200,000	1964
West Penn Group, Reactor No. 2	Ohio Valley	200,000	1965
Carolinas-Virginia Nuclear Power Associates, Inc		10-30,000	****
Chugach Electric Association*	Anchorage, Alaska	10,000	
Pacific Gas & Electric Co		*******	****
City of Piqua, Ohio*	********	12,500	****
Puerto Rico Water Resources Authority-AEC	Puerto Rico	15-20,000	****
Middle South Utilities	********	******	****

In addition to the foregoing, there is a small, experimental project in California which is now in operation. This involves Southern California Edison Co., which has tied a generator to a 7,500-kw experimental sodium graphite reactor built by North American Aviation, Inc., for AEC.

\*\*Pinanced by AEC.\*\*



#### Logical First Step to Economy: **Bucyrus-Erie Electric Shovels**

Opening a new pit or working an old one, Bucyrus-Erie Ward Leonard electric shovels can be depended upon to help hold mining costs in line. For example, the 150-B in an Ohio coal mine, above, loads big tonnages of coal economically day in and day out, month after month.

This machine is engineered specifically to meet today's demands for low-cost, high production. The exclusive frontend design, with two-section boom and tubular dipper stick, and with crowd machinery on the revolving frame, reduces weight and assures plenty of strength for tough digging. Because there is less deadweight, swing speeds are faster and there are more payloads every hour. Powerful main machinery is easily accessible for servicing. Exceptional smoothness and ease of operation result from Ward Leonard electric controls.

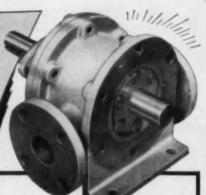
Find out more about how Bucyrus-Erie electric shovels can help you reach production goals economically. Bucyrus-Erie Company, South Milwaukee, Wisconsin.



A Familiar Sign . . . BUCYRUS . . at Scenes of Progress



# New!.. FLOOD CITY HIGH PRESSURE SPRAY or FIRE PUMP



• Here is no ordinary pump! Here is a pump designed to do a pumping job under the most adverse conditions. This rotating vane, positive displacement pump employs round stainless steel rollers instead of the

Dirt or Coal Particles Pass Right

usual flat type vone. A feature which allows for free, full flow pumping of dirt or coal particles which would jam or damage the conventional type pump. This pump reduces cavitation and performs efficiently at standard motor speeds. Friction and power consumption are reduced by the roller action of the vane...an

action similar to that of a roller bearing.

Through!

● Built in various capacities the 10 GPM size at 100 to 125 pounds pressure is suited for spraying. At 50 pounds pressure the 50 GPM size takes care of fire pump needs. In refilling the tank merely place the hose in the water supply and reverse the motor. This new high pressure pump is made of "Flood City" acid resisting bronze with a stainless steel shaft. Other materials available upon request.



#### FLOOD CITY BRASS & ELECTRIC CO.

JOHNSTOWN, PA.

Sales Agents: Kanawha Rail & Machinery Co., Charleston, W. Va.

They're Interchangeable They're Simple They're Quick



Put Economy and Flexibility in your Pipelines

Send for literature and prices. Distributor territories open.

STANDARD and LIGHTWEIGHT

#### **ALUMIRON COUPLINGS**

(Made in Aluminum or Malleable Iron)

- ◆ Think back—remember the effort required to make and complete pipeline joints? Now you can do it an easier way with these two-bolt malleable iron Couplings. Pipeline progress dictated the design of Alumiron Couplings making them the simple, quick, positive, low cost way to join grooved-end steel, aluminum, cast and wrought iron and spiral pipe.
- Alumiron speedily joins grooved-end pipe by the mere tightening of two bolts which run through the coupling halves. The Buna N or oil resistant Neoprene gasket inside the coupling halves firmly and evenly grips the pipe ends making a leak-proof seal which increases as pipeline pressure mounts. This flexible Coupling permits the line to "come and go" with rough and uneven terrain. Component parts are interchangeable with other grooved-end couplings.
- Standard Series to 1,000 PSI working pressure in sizes 1" through 8". Lightweight Series to 500 PSI working pressure in sizes 2", 2½", 3", 4".

#### CHARLES E. MANNING CO.

4700 CLAIRTON BLVD. PITTSBURGH 36, PA.

#### Atom Power (Continued)

million program of federal reactor construction. This year's \$10 million is a small victory by comparison.

But figures don't tell the whole story. AEC is required to report to Congress by next April on its studies of the natural uranium and plutonium production reactors. It may then be ordered to undertake full-scale construction.

The Democrats argue for the natural uranium reactor on the grounds that it has proved successful in Britain and with it Britain stands to capture the international export market for power reactors.

The administration forces say that the reactor is too costly to build and operate and is out of date compared with the types being developed in this country. They also say it would be wasteful to spend money on building a reactor to get information that can be had for the asking from the British.

The plutonium recycling reactor, also wanted by the Democrats, would be designed to develop the use of plutonium as a fuel. Democrats note that if disarmament talks are ever successful this country will have large stocks of plutonium lying around and the best use for it would be as a fuel in power reactors.

There is another side to the picture. The bulk of the power reactor money requested by AEC this year (fiscal 1958) was intended for projects planned by public power groups—electric cooperatives and municipal groups. Money was requested for only one specific private industry project, the Power Reactor Development Co. reactor at Monroe, Mich.

This may be why the AEC had little trouble obtaining the funds it sought.

If projects that the AEC wanted money for had been for private power plants the story might have been different.

With regard to the public power projects, which AEC was financing anyway, Congress has now stipulated that the commission must take over direct control of the construction instead of leaving it to the co-op or municipality and the manufacturer to work out. This applies to reactors planned by the Chugach Electric Association, Alaska; Rural Cooperative Power Association, Elk River, Minn.; Wolverine Electric Cooperative, Hersey, Mich.; and City of Piqua, Ohio.

Republicans succeeded in modifying the arrangement concerning these public power projects by inserting the requirement that AEC should sell the reactors to these groups at the end of ten years or failing that, dismantle them.

What this all indicates is that from here on in it is going to be increasingly difficult for AEC to obtain funds from Congress to assist directly any private industry atomic power projects. At the same time there will be constant pressure on the commission to undertake construction of full-scale power reactors on its own.

In terms of atomic power progress today, congressional action stacks up this way:

1. By passing a bill providing for federal indemnity insurance of up to \$500



#### (but look at its capacity!)

Here's a recent type of Bethlehem mine car that contains every element of good design and construction. It's as modern as today. So low that it hugs the tracks, it is particularly suitable where headroom is limited. Its overall height is a scant four ft. Yet, when levelfull, it has a capacity of almost 15 tons of coal.

This is an all-welded car equipped with automatic couplers, rubber draft gear, cast-steel trucks, roller bearings, and forged-steel wheels and axles. It is designed for rotary dump.

The car is one of a sizable fleet that Bethlehem delivered to a West Virginia mine. It is a special model designed to meet the needs of that particular set-up. You yourself may prefer some other design—but whatever your haulage requirements, Bethlehem can build the appropriate car.

Feel free to consult with our engineers when technical aid is desired. They will gladly help you design welded or riveted models for end-dump or rotary-dump service. And when the plans have been approved, you can count on the Bethlehem shops for a thoroughly expert building job.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



#### BETHLEHEM STEEL

#### Atom Power (Continued)

million for all licensed atomic power projects, Congress has removed what industry claimed was a major hurdle to atomic power progress. If the bill had not been passed, indications were that work would stop on the Commonwealth Edison Co. project in Chicago and possibly on others.

2. The authorization and appropriations bills as passed by Congress give AEC substantially all the money it requested, that is \$2.2 billion instead of \$2.4 billion.

And finally, Congress, after batting the item around for awhile, left in \$30 million requested by AEC for research and development aimed at assisting any reactor proposals received under the socalled third round invitation.

At present AEC is discussing two proposals which will come under this round. These are the natural uranium reactor proposed by the Florida Power Group and the boiling water reactor proposed by the Northern States Power Group (table). AEC expects others.

AEC's third round invitation was designed to spur industry to come forward with proposals for power reactors. The invitation requires that all proposals must be completed by June 30, 1962 or else AEC will start building reactors.

Congress has now set another time limit on this invitation. It has stipulated that all proposals must be approved by AEC no later than Dec. 21, 1958.

Thus atomic power development is relatively in the clear. In terms of numbers of plants being planned or constructed though, there will be no radical change from the pace that was developing naturally. On the international picture there may be more rapid changes. Congress this session passed a bill providing for U. S. participation in the International Atomic Energy Agency. The U. S. has already agreed to contribute 5,000 kgs of uranium fuel and offered further to match the total contributions of all other nations up to July 1, 1960.

The fuel contribution offer sparked the Bricker Amendment in Congress which, as subsequently modified, stipulates that all contributions of nuclear fuel from the U. S. to countries abroad, excluding the above obligation in the IAEC pact, must be cleared by Congress.

Participation in the IAEC should see increased activity in the foreign field with greater U. S. activity here. Experts have been saying for some time that foreign countries with their high fuel costs offer the logical field for the early development of U. S. reactor technology until atomic power is perfected to where it can compete in this country with the cost of conventional fuels.

#### Light Rein Policy For Oil Importers

The Eisenhower administration has decided that crude oil imports should be limited to 1,031,000 barrels per day. The big question now is whether the government can make the restriction stick without imposing actual controls.

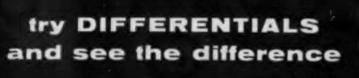
Following a study by a special cabinet committee, the President announced a new voluntary program to hold imports of foreign crude oil to some 11.5% of domestic demand in the next year.

September hearings are scheduled by Capt. Matthew Carson, administrator of the new program, who will hear objections which already have been lodged by several importing companies against their voluntary "quotas."

The government's dilemma is this: If it fails to allow any adjustments to companies which are especially pinched by the restrictions, they may fail to go along with the voluntary program. And if any sizeable exceptions are granted, independent oil producers are expected to demand tough new legislation when Congress convenes next year.

As expected, President Eisenhower ignored pleas from the National Coal Association to include fuel oil imports in the restriction attempt. In fact, although officials will keep an informal eye on residual fuel oil imports, there is no longer any requirement for residual oil imports to be reported to either the office of Defense Mobilization or Capt. Carson.

Although the new program has no real enforcement machinery, government officials have warned that formal restraints—such as tariffs or quotas—may be im-



#### 1 payload

Greater cubic capacity for given length, width, and height because of Differential's "Axless" construction.



**maintenance** 

Easier riding, lower rolling friction, "Axless" truck design requires less maintenance — yields more ton miles per wheelrim replacement.



SINCE 1915 - PIONEERS IN HAULAGE EQUIPMENT

#### Differential Products include:

Mine Cars, Mine Supply Cars, Mantrip Cars, Dumping Devices, Air Dump Cars, Rock Larries, Complete Haulage Systems, Charging Box Cars, Ingot Mold Cars, Locomotives.





### Tractairs\* Save \$150 a Day at Blasting Site

Le Roi tractor-compressor used to drill shoot-holes for blasting overburden

Easier and safer to handle on rough terrain than dozerdrawn compressors, superintendent says

The V. N. Green Co., Brown's Branch, W. Va., saves \$50 per day at each site by using Le Roi Tractairs to drill shoot-holes for blasting surface rock at their strip mining operations. When all three Tractairs are used, as is generally the case, daily savings total \$150, reports John W. Green, job superintendent.

Previously-used wheel type compressors had to be moved around the site by a standby dozer. The 10 to

15 moves per day took two hours. The dozer lost the same amount of time, too, when its work was interrupted.

#### **Mobility Minimizes Delays**

Green points out that now "the Tractair is driven directly to the drilling area, the hose is attached, and drilling starts at once." In addition. Tractair's easy maneuverability over the extremely rough terrain cuts previous relocation time by more than half, and eliminates the need for the dozer as well as the operator.

Because it's self-propelled, the Le Roi tractor-compressor is ideal for this type of work. When a job is done, the Tractair provides fast transportation for the operator, drill, and compressor to the next site. There's no need to wait for other equipment to make the move.

What's more, close-to-the-job air power shortens hose lines, substantially reduces hose damage, and eliminates power loss. The shorter lines and Tractair's 125 cfm output permit the use of two drills, when necessary.

#### Performs Various Jobs

Bought originally for drilling shootholes, the Tractair can be used for other jobs, too. "We also use our Tractairs to break paving on road construction jobs where we do the resurfacing, to tamp backfill for drain pipes, and even to clean pavement by using a rotary brush attachment."

The self-propelled, multi-purpose Tractair can provide similar savings for you. And its ready adaptability to a wide range of attachments can help you reduce the cost of operations requiring costly, one-purpose equipment. Contact Le Roi today.

\*"Tractair" is the registered trademark for Le Roi's combination

EROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, Tractair,® portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products,) 7.77

#### Atom Power (Continued)

million for all licensed atomic power projects, Congress has removed what industry claimed was a major hurdle to atomic power progress. If the bill had not been passed, indications were that work would stop on the Commonwealth Edison Co. project in Chicago and possibly on others.

2. The authorization and appropriations bills as passed by Congress give AEC substantially all the money it requested, that is \$2.2 billion instead of \$2.4 billion.

And finally, Congress, after batting the item around for awhile, left in \$30 million requested by AEC for research and development aimed at assisting any reactor proposals received under the socalled third round invitation.

At present AEC is discussing two proposals which will come under this round. These are the natural uranium reactor proposed by the Florida Power Group and the boiling water reactor proposed by the Northern States Power Group (table). AEC expects others.

AEC's third round invitation was designed to spur industry to come forward with proposals for power reactors. The invitation requires that all proposals must be completed by June 30, 1962 or else AEC will start building reactors.

Congress has now set another time limit on this invitation. It has stipulated that all proposals must be approved by AEC no later than Dec. 21, 1958.

Thus atomic power development is relatively in the clear. In terms of numbers of plants being planned or constructed though, there will be no radical change from the pace that was developing naturally. On the international picture there may be more rapid changes. Congress this session passed a bill providing for U. S. participation in the International Atomic Energy Agency. The U. S. has already agreed to contribute 5,000 kgs of uranium fuel and offered further to match the total contributions of all other nations up to July 1, 1960.

The fuel contribution offer sparked the Bricker Amendment in Congress which, as subsequently modified, stipulates that all contributions of nuclear fuel from the U. S. to countries abroad, excluding the above obligation in the IAEC pact, must be cleared by Congress.

Participation in the IAEC should see increased activity in the foreign field with greater U. S. activity here. Experts have been saying for some time that foreign countries with their high fuel costs offer the logical field for the early development of U. S. reactor technology until atomic power is perfected to where it can compete in this country with the cost of conventional fuels.

#### Light Rein Policy For Oil Importers

The Eisenhower administration has decided that crude oil imports should be limited to 1,031,000 barrels per day. The big question now is whether the government can make the restriction stick without imposing actual controls.

Following a study by a special cabinet committee, the President announced a new voluntary program to hold imports of foreign crude oil to some 11.5% of domestic demand in the next year.

September hearings are scheduled by Capt. Matthew Carson, administrator of the new program, who will hear objections which already have been lodged by several importing companies against their voluntary "quotas."

The government's dilemma is this: If it fails to allow any adjustments to companies which are especially pinched by the restrictions, they may fail to go along with the voluntary program. And if any sizeable exceptions are granted, independent oil producers are expected to demand tough new legislation when Congress convenes next year.

As expected, President Eisenhower ignored pleas from the National Coal Association to include fuel oil imports in the restriction attempt. In fact, although officials will keep an informal eye on residual fuel oil imports, there is no longer any requirement for residual oil imports to be reported to either the office of Defense Mobilization or Capt. Carson.

Although the new program has no real enforcement machinery, government officials have warned that formal restraints -such as tariffs or quotas—may be im-

# try DIFFERENTIALS and see the difference

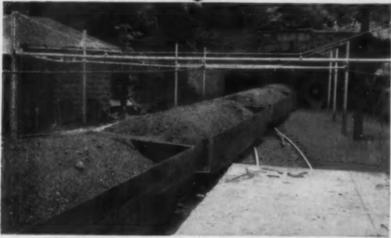
#### 1 payload

Greater cubic capacity for given length, width, and height because of Differential's "Axless" construction.



maintenance

Easier riding, lower rolling friction, "Axless" truck design requires less maintenance — yields more ton miles per wheelrim replacement.



SINCE 1915 - PIONEERS IN HAULAGE EQUIPMENT

Differential Products include:

Mine Cars, Mine Supply Cars, Mantrip Cars, Dumping Devices, Air Dump Cars, Rock Larries, Complete Haulage Systems, Charging Box Cars, Ingot Mold Cars, Locomotives.



Tractair, portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.



### Tractairs\* Save \$150 a Day at Blasting Site

Le Roi tractor-compressor used to drill shoot-holes for blasting overburden

Easier and safer to handle on rough terrain than dozerdrawn compressors, superintendent says

The V. N. Green Co., Brown's Branch, W. Va., saves \$50 per day at each site by using Le Roi Tractairs to drill shoot-holes for blasting surface rock at their strip mining operations. When all three Tractairs are used, as is generally the case, daily savings total \$150, reports John W. Green, job superintendent.

Previously-used wheel type compressors had to be moved around the site by a standby dozer. The 10 to 15 moves per day took two hours. The dozer lost the same amount of time, too, when its work was interrupted.

#### **Mobility Minimizes Delays**

Green points out that now "the Tractair is driven directly to the drilling area, the hose is attached, and drilling starts at once." In addition, Tractair's easy maneuverability over the extremely rough terrain cuts previous relocation time by more than half, and eliminates the need for the dozer as well as the operator.

Because it's self-propelled, the Le Roi tractor-compressor is ideal for this type of work. When a job is done, the Tractair provides fast transportation for the operator, drill, and compressor to the next site. There's no need to wait for other equipment to make the move.

What's more, close-to-the-job air power shortens hose lines, substantially reduces hose damage, and eliminates power loss. The shorter lines and Tractair's 125 cfm output permit the use of two drills, when necessary.

#### Performs Various Jobs

Bought originally for drilling shootholes, the Tractair can be used for other jobs, too. "We also use our Tractairs to break paving on road construction jobs where we do the resurfacing, to tamp backfill for drain pipes, and even to clean pavement by using a rotary brush attachment."

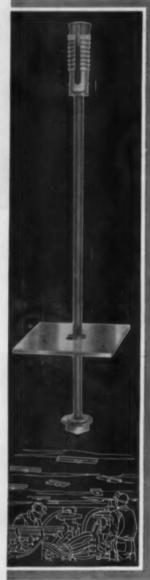
The self-propelled, multi-purpose Tractair can provide similar savings for you. And its ready adaptability to a wide range of attachments can help you reduce the cost of operations requiring costly, one-purpose equipment. Contact Le Roi today.

\*\*\*Tractair\*\* is the registered trademark for Le Roi's combination tractor—air compressor.

Tractair,® portable and stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.)

# COMPARE

...and you, too, will specify
West Virginia Mine Roof Bolts!



#### Mine Roof Bolt Check List

West Virginia Mine Roof Bolts

	Yes	No
Safety Tested?		
Easy to Install?		
Extra Gripping Power?		
Uniform Quality?	. 4	
Prompt Delivery?	. 7	
Field Engineering Service?	V	
Reliable Source?	. 7	
Personalized Service?		

For Safety,
Quality and Service,
it's West Virginia
Mine Roof Bolts!

Contact West Virginia Works, Connors Steel Division, H.K. Porter Company, Inc., Huntington, West Virginia

H. K. PORTER COMPANY, INC.

#### Oil Imports (Continued)

posed by the administration unless the companies voluntarily hold down their crude imports.

The reactions among oil companies to the federal administration's order to cut crude oil imports ranged from forthright compliance to outright refusal.

Some companies—Standard Oil of New Jersey, Standard Oil of California, the Texas Co. and Gulf Oil Corp.—agreed to comply. At least four others—Atlantic Refining Co., Tidewater Oil Co., Socony Mobil Oil Co. and Sinclair Refining Co.—protested that there were inequities in the program. Only one importer, the Sun Oil Co., flatly refused to cooperate. Sun Oil said that in its opinion compliance would "constitute steps toward cartel arrangements that are forbidden by the Federal anti-trust laws."

#### **News Briefs**

Pittston Co. is building a \$250,000 coal research and testing lab.

The lab will be built on property owned by Pittston's Clinchfield Div. in Virginia near Moss 3 mine.

The Electro Metallurgical Co. opened a mine at Bell Creek, W. Va., and announced it would close its No. 2 mine at Alloy, W. Va.

Although Electro Metallurgical disclosed no tonnage figures, the company said Bell Creek was already approaching full commercial production. The alloy No. 2 mine is being closed because the Gas and Hershaw seams on the property are depleted. Bell Creek coal is being burned at Electro Metallurgical's 125,000-kw station at Alloy. The company is a division of Union Carbide Corp.

Pittsburg & Midway Coal Mining Co. is planning to construct an office building in Pittsburg, Kan.

The building will house the company's treasury, engineering and production divisions. Pittsburg & Midway operates in Kansas, Missouri, Illinois, Kentucky and Arkansas. Kenneth A. Spencer is president of the coal company as well as the Spencer Chemical Co.

Edgewater mine, Tennessee Coal & Iron Div. of U. S. Steel, and the Goodspring mine, Penag Coal Co., won "Sentinel of Safety" awards in the U. S. Bureau of Mines' 32nd National Safety competition.

Edgewater, located at Wylam, Jefferson County, Ala., posted the best safety record among underground bituminous coal mines by working 766,644 man hours without a disabling injury. Goodspring mine, located in Pennsylvania's Schuylkill County, worked 106,162 man hours with 14 disabling injuries. The mine's injury severity rate was 0.923 day lost per thousand man hours of exposure

to hazard-the lowest in the underground anthracite mine group.

Chafin Coal Co. is planning to develop a 2,000-tpd mine near Logan, W. Va.

The company disclosed that it is investing \$1.5 million and expects operations to begin in January. The mine will be situated in the Rich Creek section of Logan County, which is approximately 10 mi south of the community of Logan. Chafin officials said that the leased acreage it will mine contains 40 to 50 yr of reserves.

The Glen Alden Corp., Wilkes-Barre, Pa., showed a 95.6% rise in net profit for the first half of 1937, compared to the same period in 1936.

The company's profit rose to \$1,527,-000 against \$777,000 for the comparable 1956 period. Earnings were 87c a share to June 30, compared to 44c a share to June 30, 1956. Net sales from all Glen Alden operations were \$36,872,000, compared to \$35,481,000 for the same period in 1956. Glen Alden's president, Francis O. Case, expects second half earnings to show a gain over the first half.

The Northwest Regional Coal Association is launching an extensive advertising and sales promotion campaign to recapture markets lost to other fuels.

The campaign will stress the dependability and economic advantages of coal for heating and for industrial purposes, according to J. O. Anderson, Pocatello, Ida., head of the group. Northwest Regional Coal Association has members in Utah, Wyoming, Idaho, Nevada, Montana, Oregon and Washington.

Enoco mine's first shift team, Enoco Collieries Corp., was declared state champion after winning Indiana's First (Continued on p.150)



COAL MEN ON THE JOB . . .

DEBARDELEBEN COAL CORP.,
Birmingham, Ala.—Officials L. O.
Stonecyher left), general superintenkdent, and N H. De Bardeleben, president, discuss operations at new
Waterside mine.

If you convey this . . .

# QUAKER CONVEYOR BELTING FOR SAFETY AND STAMINA!

Quaker Rubber's fire-resistant, flameretarding belt actually exceeds the U. S. Bureau of Mines essential standards for underground mine safety.

The specified flame test permits burning up to 1 minute. But when the test is made on Quaker's belt, the flame is extinguished instantly. What's more, afterglow disappears in about one-third the time required by Bureau standards.

This belt is also lightweight and highly flexible. It has good troughability, yet is tough enough to take shock impacts and heavy, jagged loads. Made in any length. Widths up to 72".

Next time, specify "Fire Resistant U.S.B.M. 28-11" from your Quaker Rubber or Quaker Pioneer Rubber distributor. You'll like the savings . . . and the service.

For more information, write to: H. K. Porter Company, Inc., Quaker Rubber Division, Philadelphia 24, Pennsylvania, or Quaker Pioneer Rubber Division, Pittsburg, California.

H. K. PORTER COMPANY, INC.



IF IT CARRIES CURRENT K CARRIES IT!

CABLE

# "TOUGHEST, MOST FLEXIBLE TRAILING CABLE WE'VE EVER USED IN OUR MINES"

Says General Superintendent

"In fact," says Mr. L. G. Bishop of De Bardeleben Coal Corp., "the KW Laytex" 'Kaiser Master' Trailing Cable undergoes the roughest service you can think of.

"Because of the low roof in our mine, many of our cutting and loading machines cannot carry a reel. That means the full length of the cable (over 400 feet) is dragged and yanked over rough, sharp-edged stones and through wet areas."

#### Flexibility helps prevent cracking, breaking

Mr. Bishop and his fellow officials of the mine also like the flexibility of KW "Kaiser Master" cable — a stiffer cable would crack or break when pulled from its coil.

"What's more," says Mr. Bishop, "KW's resistance to cuts and bruises helps to prevent short circuits. It's the smoke from short circuits that drives miners from their working areas.

"That's one more reason why we plan to convert completely to KW 'Kaiser Master' Trailing Cables."

A KW representative will be glad to give you immediate service to your needs. Call the Kaiser Aluminum sales office or KW distributor listed in your telephone directory. Kaiser Aluminum & Chemical Sales, Inc., Executive Office, Kaiser Bldg., Oakland 12, Calif.; General Sales Office, Palmolive Bldg., Chicago 11, Illinois.



Tough-KW Portable Cable can take the punishment of being repeatedly run over by heavy equipment like this!



Dependable—KW cable stands up under this kind of treatment as regular routine—hauled, jerked and dragged over wet, rough mine floors.



Flexible—KW cables go anywhere in the mine... and whether on or off the reel, it's cable nobody has to "baby."



Here's an off-track coal-cutting machine being used in the mine's  $23\frac{1}{2}$ -inch coal seam. The KW "Kaiser Master" Trailing Cable is pulled along behind it, since no reel can fit into this space.

# Kaiser Aluminum

IF IT CARRIES CURRENT, K CARRIES IT!





• REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astoniahing advantage—when repair worh is completed belts may be returned to service immediately.

 REMA seals out moisture, reduces mildew, rot and deterioration — the great enemies of conveyor belts. Your own maintenance man can quickly repair your belt — it doesn't take a skilled belt mechanic to use REMA.

Used for repair of all types of damaged spots, edge wear and for covering metallic joints. Available in introductory kits or parts separately.

Order from your Flexce-Alligator distributor
Write for Folder No. R4

FLEXIBLE STEEL LACING CO. 4638 Lexington St., Chicago 44, III.



#### **Current Coal Patents**

By Oliver S. North

Method of and apparatus for the continuous mining of mineral material by combined drilling, undercutting and shooting operations, A. H. Mandt, July 16, 1957. An improved method for continuously drilling and undercutting and periodically shooting a hard coal face in advance of a mining machine. Bore holes are drilled into one part of the face at the same time that coal is being broken away from another part of the face. Thus, a bottom kerf is produced simultaneously with drilling, which expedites the necessary shooting. No. 2.799,488.

Auger head, M. McClennan (assigned to The Austin Powder Co., Cleveland, Ohio), July 23, 1957. Design for an earth auger tool adapted to pierce rock such as the formations encountered in overburden at strip mines. The head is self-piloting, and the over-all improved construction enables the head to penetrate hard materials without breakdown or loss of efficiency. No. 2,800,302.

Automatic stepper type transport device, J. F. Joy (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. Improved hydraulic walking jack device for advancing, turning, and moving continuous miners in non-rectilinear paths. The apparatus has low height, extreme maneuverability and single-valve control. No. 2,800,968.

Automatic creeper control mechanism for mining machines, D. D. Ziegler (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. Design for a mining machine creeper base. Control valves can be set for automatic operation of a walker mechanism to tram the machine when it is not mining coal. Two pumps provide hydratilic fluid under pressure. When the conveyor drive is shut down the fluid in the conveyor pump is made available to the walking mechanism to accelerate the machine's movement rate. No. 2.800,969.

Creeper base for mining apparatus, A. L. Barrett (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. This continuous mining apparatus is very low in height, and therefore suited for use in mines having low head room. Improved creeping base structure enables the machine to be moved, laterally positioned and steered in an extremely flexible manner. No. 2,800,970.

Mobile curvable conveyors, J. M. Hill, July 30, 1957. Anti-friction support and guide means for guiding mobile conveyor elements in their movement on the wheel-supported, articulated frame sections provides positive gripping traction means for engaging the conveying member. No. 2,800,994.

Underground shale retorting process, J. W. Scott, Jr. (assigned to California Research Corp., San Francisco, Calif.), July 30, 1957. A process for underground retorting of coal, oil shales, tar sands and the like. No. 2,801,089.

Mining and loading apparatus involving core cutting and dislodging means, J. F. Joy (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. Various improvements for a continuous mining machine. When a machine of this construction is used, an orbital kerf can be readily cut in solid coal. No. 2,801,091.

Coal breaker wedge device, J. F. Joy (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. Design for a powerful and efficient device for breaking and dislodging mineral from a solid coal face. The device is incorporated in a mining machine, and provides means for breaking out the maximum amount of large lump coal. No. 2,801,092.

Method of and apparatus for mining by slot cutting and dislodging, J. F. Joy (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. Continuous miner of a construction suitable for complete mechanical mining and transportation of coal in either thick or thin seams, and in relatively restricted areas resulting from close roof propping or timbering common to longwall coal faces. No. 2,801,093.

An adjusting mechanism for boring arms of a rotary boring head, C. F. Ball (assigned to Joy Mfg. Co., Pittsburgh, Pa.), July 30, 1957. The adjusting mechanism for the retractable boring arms of a boring head of a "twin-bore" mining apparatus comprises co-acting mechanically and fluid-operated adjusting devices. No. 2,801,094.

Method of and apparatus for gasifying pulverized coal, P. R. Grossman and T. S. Sprague (assigned to The Babcock & Wilcox Co., Rockleigh, N. J.). July 30, 1957. Improved process and apparatus for producing synthesis gas by the partial combustion of pulverized coal in the presence of oxygen and steam. No. 2.801.158.

Material feed regulator, W. Krauss (assigned to Fuller Co., Catasauqua, Pa.), Aug. 13, 1957. Means for accurately controlling flow of fluidized particulate solids, such as pulverized coal, from bins to other apparatus, such as kilns, bagging machines, etc. No. 2,802,698.

Mechanical miner equipped with a collapsible mining head, R. F. Risse (assigned to Goodman Mfg. Co., Chicago, Ill.), Aug. 6, 1957. As an improvement for a coal mining machine of the type which cuts contiguous bores,

# Eliminate costly enclosures with Allis-Chalmers weather-protected MOTORS

Modern features
cut operating, maintenance
expense...give
MORE dependability

Here's a newly designed line of Allis-Chalmers weather-protected motors with the ability to "take" outdoor conditions. This means no expensive protective enclosures are needed . . . a big saving in plant or installation building costs.

Designed to meet defined NEMA requirements, these motors incorporate many important features which assure dependable outdoor operation:

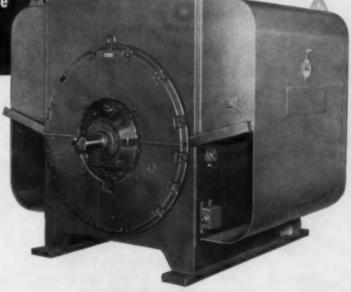
- Ventilating System Low velocity intake, vertical lift, change of direction and high velocity discharge of ventilating air keep rain, snow, sleet, dust and dirt out of vital parts.
- Removable Air Ducts To facilitate inspection and maintenance of interior air passages, air intake ducts are designed for quick removal.
- Stator Assembly Removable as a unit, it simplifies maintenance and minimizes downtime.

sign permits access to motor interior without disturbing the bearings or their enclosures. Positive vapor seal is used on high-speed motors. Antifriction bearings are available for slow speed motors.

• Split Sleeve Bearings - Capsulized de-

• Proven Insulation — Famous Allis-Chalmers insulation systems (Class A and B) are available. And, for extreme temperatures, or where high resistancé to abrasion and moisture is required, Allis-Chalmers can provide the revolutionary Silco-Flex system.

THIS DESIGN available in ratings from 250 to 900 hp. Other designs in larger horsepower ratings are also available. Contact your A-C sales office or write Allischalmers, General Products Division, Milwaukee 1, Wisconsin. Ask for Bulletins 51B8606A and 05B7894.



Silco-Flex is on Allis-Chalmers trademark.



**ALLIS-CHALMERS** 

#### Coal Patents (Continued)

the cutter chain guides are arranged to have a retractable movement in a length-wise direction, while at the same time having their normal raising and lowering movement for retraction. A rectangular bore is cut. No. 2,801,836.

Planer type mining machine, H. R. Sander, Aug. 6, 1957. Design for a bilaterally acting planer used for peeling hard coal seams of low thickness. The coal is wedged out first in the middle of the seam, then wedge-shaped knives peel the mineral along planes of relieved stress. No. 2,801,837.

Rotating disintegrating drum for continuous miner, E. A. Bradley (assigned to Joy Mfg. Co., Pittsburgh, Pa.), Aug. 6, 1957. An improved rotary toothed disintegrating drum for a continuous mining machine. No. 2,801,838.

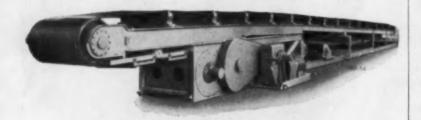
Tunneling machine having rotating cutting bars, R. D. Budd (assigned to Goodman Mfg. Co., Chicago, III.), Aug. 13, 1957. This mining or tunneling machine is designed with a boring head rotating on an axis corresponding to the tunnel axis. Cutter bars are inclined at an angle to the face, so that they may follow a helical path in operation. No. 2,802,653.

Mine arch supports, O. Kuhn (assigned to Deutsche Kohlerbergbau-Leitung, Essen, Germany), Aug. 6, 1957. In an improved mine support, the roof bar is composed of two or more sections hinged at the joints to permit relative angular adjustment. Each section is pivotally connected to a pit prop. The outer ends of the roof bar are connected by a draw means, e.g. a steel strap, which is supported against the bar sections by resilient means, such as coil springs. No. 2,801,522.

Boring type mining machine having chain cutter cusp removing means, J. Gonski (assigned to Goodman Mfg. Co., Chicago, Ill.), Aug. 13, 1957. Improvement in lower cutter chains used with multiple head boring type mining machines. Means are provided for depositing cusp cuttings at a place short of the far side of the machine and in a position to be readily gathered and removed, so as not to interfere with free operation of the cutter chain. No. 2.802,654.

For fast main-line haulage,

### JEFFREY 80-A BELT CONVEYORS



Record tonnages at the mine face demand that coal be hauled away fast, or production will bog down. Jeffrey offers a solution, the 80-A Belt Conveyor.

Its husky head was designed especially for rapid, heavy haulage... built for drives up to 160 HP and belt speeds up to 600 FPM. It has tandem drive for maximum contact with drive pulleys, and a pneumatic takeup for proper slack tension on the belt.

The 80-A frame is adaptable to 30, 36 and 42-inch conveyor belts and permits a choice of various standard Jeffrey idlers. Let us quote on your requirements. The Jeffrey Manufacturing Company, 912 North Fourth Street, Columbus 16, Ohio.



MINING • CONVEYING • PROCESSING EQUIPMENT...TRANSMISSION
MACHINERY...CONTRACT MANUFACTURING

### **Equipment Approvals**

Seven approvals of permissible equipment were issued by the U. S. Bureau of Mines during July.

Wilcox Mfg. Co.—Type WCM-HEA-27 miner; two motors, one 50 hp and one 5 hp, 440 v, AC Approval 2-1268A, July 1.

Joy Mfg. Co.—Type 28T-2F twinbore continuous miner; five motors, two 100 hp, two 15 hp, one 30 hp, 500 v, DC. Approval 2-1252A, July 12. [Approval 2-1252 covering 250-v mining machines of this type was issued May 10, 1957.]

Dooley Brothers—Roof drill; four motors, three 5 hp and one 4 hp, 250 v, DC; or (option) two 5 hp and two 7½ hp, 250 v, DC. Approval 2-1269, July 12.

Jeffrey Mfg. Co.—Type 76BM Colmol; three motors, two 70 hp and one 50 hp, 440 v, AC. Approval 2-1270A, July 26.

Joy Mfg. Co.—Types 6SC5BPE/ BPXE-5 shuttle cars; three motors, each 10 hp, 250 v, DC. Approval 2-1271, July 30.

Jamison Coal & Coke Div., Consolidation Coal Co.—Rebuilt Goodman 402 miner; four motors, two 100 hp and two 10 hp, 250 v, DC. Approval 2-1272, July 30.

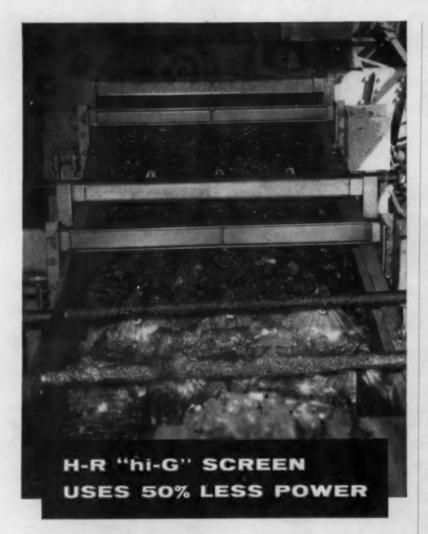
Ensign Electric & Mfg. Co.—Type LKG distribution bex; one 600-amp, one 225-amp and one 100-amp, 220-/ 440-/550-v, AC circuit breakers. Approvels 2-1273 and 2-1273A, July 31.



This working quality means longer service life on your job. Add to this the fact that Royal Blue is stronger than the strongest rope you have been using and you have two excellent reasons why it has enjoyed faster acceptance than any wire rope in Roebling's history. Your distributor or Roebling Sales Office will give you the complete story, or contact John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Distributors, Branches and Warehouses Throughout the Country—Subsidiary of The Colorado Fuel and Iron Corporation.



To reclaim coal from a 4-million ton waste pile, Black Star Anthracite Coal Company of Hazleton, Pa., uses a Hewitt-Robins bulk materials handling system which processes about 200 tons of material per hour. Coal is reclaimed, washed, sized, and recovered at the rate of 20 tons per hour.

An important unit in the system is Hewitt-Robins' "hi-G" Vibrating Screen, which operates on 50% less power. Savings up to \$500 per year are realized with 6 x 28 ft. sizes. Readily accessible lower deck permits clear observation, easy spray pipe installation, and quick cloth changes.

To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Conn.



CONVEYOR BELTING AND IDLERS... POWER TRANSMISSION DRIVES INDUSTRIAL HOSE... VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

#### News Briefs (from p143)

Annual Safety and First Aid Meet.

Second place was won by the Green Valley mine, Snow Hill Coal Corp. Third place was won by Enoco mine's second shift team. The meet was held during the annual state miners' picnic.

The August 5 issue of Railway Age is carrying a report on a coal gas fired locomotive developed by Bituminous Coal Research.

The locomotive, which is undergoing a series of long tests, is burning "air fluidized" coal at one-fourth the cost of diesel fuel. The magazine also reports that an agreement has been reached between Alco Products, Inc., and the Union Pacific RR to put the first commercial unit on wheels. The future uses of a coal-gas turbine are also examined by the magazine.

The Pittsburgh Coal Co. Div., Pittsburgh Consolidation Coal Co., awarded mining engineering scholarships to Lewis Savisky, New Eagle, Pa., and John Mulhern, Brentwood, Pa.

The scholarships are awarded each year to Pittsburgh area high school graduates who wish to study mining engineering. Mr. Savisky is enrolled at the University of Pittsburgh. Mr. Mulhern will enter the school in September.

American Coal Shipping, Inc., denied in New York that it would return some of its chartered Liberty ships to the government.

The rumors appeared after dry cargo (Continued on p156)

#### Bituminous Output

YEAR TO DATE PRODUCTION
August 17, 1957 ... 308,631,000
August 18, 1958 ... 309,008,000
1957 output 0.1% behind 1956.

A month earlier output was 0.7% behind 1956.

WEEK ENDING PRODUCTION
August 17, 1957 ..... 9,600,000
August 18, 1956 ..... 9,758,000

#### Anthracite Output

YEAR TO DATE PRODUCTION
August 17, 1957 ... 16,132,000
August 18, 1956 ... 17,066,000
1957 output 5.5% behind 1956.
A month earlier 1957 was 4.9% behind 1956.



Being interviewed is H. A. Fuggiti, Acting Senior Development Engineer

#### "Here's where the heavy slugs of power come from"

At the Exide Laboratories - Reporter: Just exactly what part of the battery is that, Mr. Fuggiti?

> Fuggiti: This is the Exide-Ironclad positive plate. And in any battery, power reserve is governed by positive plate area.

> Reporter: Then do you mean that Exide-Ironclad Batteries have more positive plate area?

> Fuggiti: Exactly. You can see that here. The cylindrical power tubes are arranged in a row. So the semicircular sides give an effective plate area one-third more than the plate size.

> Reporter: How does that increase power

Fuggiti: Because there's a bigger working

surface of battery plate exposed to the electrolyte. Power response is faster.

Reporter: What does this mean in battery performance?

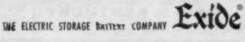
Fuggiti: It means the battery can provide power to spare for peak power loads as well as a dependable source for continuous loads.

Reporter: Obviously this is an important feature of the Exide-Ironclad Batteries.

Fuggiti: Yes it is, but it's just one of many engineering details that contribute to their long life and high capacity.

Note to battery users: Whenever you order heavy duty batteries or the equipment that requires them, besure to specify Exide-Ironclad. For detailed bulletin, write Exide Industrial Division, The Electric Storage Battery Co., Philadelphia 2, Pa.





#### Foreign News

#### CANADA

#### Springhill Closed

Nova Scotia's Springhill No. 4 mine, where an explosion killed 39 miners last November (Coal Age, December, 1956, p 140) is being closed permanently. Shuttered since the explosion, the mine was expected to be opened again. But Dominion Coal Co., the operator, says it can get all the coal it needs from a nearby mine. Most of Springhil's 7,000 residents had depended on the mine for a livelihood, and had believed

it would be reopened. But the cost of repairing No. 4 and a shrinking market have thwarted this. Springhill's Board of Trade, however, believes that the community's problems of livelihood would be solved if imports of U. S. coal were restricted.

#### ITALY

#### Coal Imports Rise

During the first 4 mo of 1957 Italian coal imports reached 4,239,000 metric

tons, compared with 3,392,000 in the same period of 1956—an increase of 25%. Most of the increased tonnage originated in the United States, which shipped 2,838,000 tons in the 4 mo period, against 1,943,000 for the same period in 1956, 1,732,000 tons in 1955 and 809,000 tons in 1954.

#### PERU

#### French Coal Purchase

The French government agency ATIC (Association Technique de l'Importation de Charbonniere) has signed an agreement with the Cia Chimbote, S. A., a Santa Valley, Peru, coal mining operator representing a number of other operators, for the purchase of 180,000 tons of Peruvian anthracite. The agreement, which is pending approval by the French and Peruvian governments, will be extended to 1 million tons if the coal meets ATIC standards. Although the price being paid by ATIC for the coal has not been made public, it is understood that it is close to the price of United States coal. After acceptance of the 180,000-ton trial shipment a contract will be drawn for up to 1 million tons. At the same time French financial interests will grant a credit of \$30 million in United States currency to the Cia Chimbote, S. A. The credit will be used for modernizing Peruvian mines, installing modern machines for washing, improving transportation methods, including the purchase or charter of seagoing vessels, and construction of port facilities. In addition, to increase the Peruvian internal market for anthracite, Peru is planning thermal power plants where hydroelectric power is not available, plus coal-burning gas-producing plants to replace the need for imported netroleum.

#### In an industry where machinery takes a beating...

# It's HARD to BEAT UP a STAMLER!

Stamler Car Spotters keep going at MAXIMUM EFFICIENCY... with a VERY MINIMUM OF MAINTENANCE COST!

WHY do STAMLER Car Spotters last so long? Why do they work so efficiently with so little parts replacement cost? Why do they go on and on — rolling the coal faster, more efficiently and at less cost than by any other method? There are several reasons. First, because of the superiority of the basic Stamler design. Secondly, because Stamler equipment is ALL HYDRAULIC . . . which means almost no maintenance and less possibility of failure due to faulty contacts or from coal dust and moisture. And then there's the matter of the inherent flexibility of the Stamler design. Put a Stamler down and into operation, pick up, move it, and re-install it elsewhere in the mine — do this over

and over again — and there's no way you can put a Stamler Car Spotter in a "bind." You don't need to be an expert! Just pick it up and lay it down — pick it up and lay it down — and your Stamler is ready to go. Get the Stamler story now!



W. R. STAMLER

SCHROEDER BROS., Exclusive Eastern Sales Agent Pittsburgh, Pennsylvania UNION INDUSTRIAL CORP., Carlsbad, New Mexico

#### CORPORATION

SALMON & CO., Birmingham, Alabama WESTERN SALES ENGINEERING CO., Selt Lake City, Utah

#### WEST GERMANY

#### Production Plan

The German Association of the Hard Coal Industry, Duesseldorf, asserts that annual hard coal production would be increased by at least 40 million tons within the next 20 yr—if a three point offered by the association is followed.

West Germany production, says the association, would rise to 175 or 180 million tons by 1977, or 30% more than the 134.4 million tons produced in 1956. The program's general features:

 Short term measures: increase mechanization, especially in coal preparation and production, to boost production 10 million tons.

2) Medium term measures: establish central production installations with a capacity of 8,000 to 12,000 tons among small neighboring mines and sink additional shafts in old mines. This would help increase production 20 million tons.

 Long term measures: develop new mines and redevelop deserted mines for another 20 million-ton increase.

From the total increase of 50 million



Leman rebuilds
Continuous Miners
to better than
original condition
in record time

speedy repair service pick-up right at the job site

Your worn-out mining machinery comes back as good as the day it was purchased—if it has been rebuilt by Leman. Or it will come back better than new with Leman improvements and latest model modifications.

The production views at left show Leman specialists rebuilding a continuous mining machine. The cutter bar in the top view will be better than new—changes in bit design have eliminated the holding plate and improved the customers' equipment. Completely new manganese steel wear plates go on the main frame in the center view. Leman cuts repair time on this work by having torch and chipper outlets at every worker's station.

Look how Leman workmen in the bottom photo leave nothing to chance. Everything—down to the last bolt—gets checked for accuracy. And, just as with this continuous miner, Leman rebuilding or repair jobs on the heaviest mining equipment, electric locomotives, etc. assure you of "good-as-new" performance.

Phone or write for prompt, courteous service on your repairs.

MACHINE CO.

Write To: Box 236, PORTAGE, PENNA.

Phone: PORTAGE 2051



### Where Do Great Ideas Come From?

From its beginnings this nation has been guided by great ideas.

The men who hammered out the Constitution and the Bill of Rights were thinkers—men of vision—the best educated men of their day. And every major advance in our civilization since that time has come from minds equipped by education to create great ideas and put them into action.

So, at the very core of our progress is the college classroom. It is there that the imagination of young men and women gains the intellectual discipline that turns it to useful thinking. It is there that the great ideas of the future will be born.

That is why the present tasks of our colleges and universities are of vital concern to every American. These institutions are doing their utmost to raise their teaching standards, to meet the steadily rising pressure for enrollment, and provide the healthy educational climate in which great ideas may flourish.

They need the help of all who love freedom, all who hope for continued progress in science, in statesmanship, in the better things of life. And they need it *now!* 

If you want to know what the college crisis means to you, write for a free booklet to: HIGHER EDUCA-

TION, Box 36, Times Square Station, New York 36, N.Y.



Sponsored as a public service, in cooperation with the Council for Financial Aid to Education

#### Foreign News (from p152)

tons the association estimates that 10 million tons would have to be deducted because of worked out operations. The association points out, too, that the total figure of 180 million tons can be reached only if neither the number of annual working days (300) nor daily working hours are reduced.

The medium-term measures suggested by the association would not only unite small neighboring mines, but place them under a program of rationalization, i.e. modernization and efficient use. Old mines would be reconstructed, aboveground installations expanded, and automatic conveying equipment would be installed. More, connecting mines would be built between undeveloped deposits and deserted mines.

#### PRODUCTION REPORT

West German strip mine production in July reached 11.45 million tons compared with about 9.95 million tons in June, according to the latest calculations of the coal industry.

Coke production amounted to 3.5 million tons, the industry reports, lignite mining to 8.41 million tons in July.

In June, 1957 9.39 million tons of coal was sold, of which 1.95 million tons were exported. In the same month coal imports amounted to 2.05 million tons.

#### **ARGENTINA**

#### Coal Trade Pact

Dollar-short Argentina is attempting to buy United States coal from Iron Curtain countries in an effort to unload \$50 million worth of Iron Curtain currencies that Argentina acquired under bilateral trade agreements. The purchases, which are in an early stage of negotiation, would solve two problems for Argentina:

1) the acquisition of coal, reportedly in very short supply, and 2) the acquisition of United States dollar currency, or credit, another item of short supply. At the same time Argentina would rid itself of the soft currencies credits it possesses.

The catch, however, is that Argentina must offer discounts running as high as 40%, since the so-called soft monies must be discounted to purchase hard monies, such as U. S. currency.

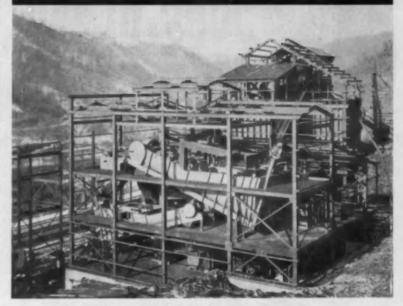
The result has been a reported agreement with Hungary for 100,000 tons of United States coal, for which Argentina will pay the equivalent of \$30.50 a ton because she will pay with soft currencies. If Argentina could afford to use its dollar reserves for a direct purchase from the United States the coal would cost only \$21.

But the Argentina government wants to liquidate a credit of \$5.9 million "treaty" dollars in Hungary—despite a discount of 40%.

Another trade pact of the same kind is reportedly being negotiated with Poland for 500,000 tons of coal. But because of Polish commitments it is not expected that more than 200,000 tons will be available.

#### **AKINS SEPARATOR**

makes 3-product separation in coal cleaning plant



This coal cleaning plant, as all prefabricated Sweco Heavy Media plants, is designed by the Southwestern Engineering Co. for the use of an Akins Heavy Media Separator, which is successfully making a 3-product separation with only one media cleaning circuit, using an Akins Heavy Media Densifier.

#### PRODUCES 2 GRADES OF COAL

This Akins Separator is making a 3-product separation, requiring only one media circuit. The Akins Separator, permitting extraction and blending of middlings with either float or sink, makes it possible to improve both grade and recovery and produce two types of coal from the same seam...one a high grade for domestic and industrial uses and one a high-ash product for large steam plants.

#### PROVED ADVANTAGES OF AKINS SEPARATORS

● 3-product separation in one machine, requiring only one media circuit ● Start-up under full load ● Entire vessel is visible and accessible ● Variation in rate or grade of feed is not detrimental ● Large pool area and volume minimize tramp refuse in the product and facilitate better recovery of values from fine sizes ● Gradation of gravity and viscosity from feed entry point to sink removal point provides natural cleaning of sink, and allows circulation of media at lower gravity and viscosity.

#### WRITE FOR NEW AKINS SEPARATOR MANUAL 56

Akins - the ORIGINAL spiral type classifier.

#### COLORADO IRON WORKS CO.

3800 Race Street • Denver 2, Colorado

AKINS CLASSIFIERS • SKINNER ROASTERS • LOWDEN DRYERS

Sales Agents and Licensed Manufacturers in Foreign Countries

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.



### Designed for SAFETY

ENSIGN Type KK-G Permissible Distribution Boxes, as illustrated, are recommended for use with mining machine, loading machine and drill.

For many years ENSIGNeers have worked diligently with the mining industry to improve ENSIGN electrical products to the end that these distribution boxes are as safe and trouble-free as can be manufactured.

ENSIGN Distribution Boxes incorporate many exclusive features . . . among them . . .

- 1. ENSIGN Safety Plugs . . . with all parts renewable
- 2. ENSIGN Heavy-Duty Ground Limiters . . . that function
- 3. ENSIGN Mechanical Trip . . . that trips the circuit breaker when the plug is disengaged, independent of electrical power

ENSIGN Distribution Boxes are available in many combinations . . . Dust-tight or Permissible . . . alternating or direct current.

For the Best in Design - Buy Ensign!

ILECTRIC AND MANUFACTURING CO.

S Avenue Huntington 4, West Va.

914 Adams Avenue

News Briefs (Continued from p150)

rates plummeted to a little more than \$4 a ton to some European ports. ACS also said it planned to keep operating despite continuing labor troubles involving jurisdictional disputes among four maritime unions.

The Dept. of Interior approved an \$550,000 mine drainage project near Wilkes-Barre, Pa., in the Wyoming Basin of Pennsylvania's northern anthracite field.

The project is the latest submitted by Pennsylvania under a \$17 million state-federal program to relieve mine flooding problems in the anthracite region. The program covers the purchase and installation of four deep-well pumps at the Buttonwood mine, Glen Alden Corp., Luzerne County.

Kentucky's Senator Thruston Morton, fro mthe Senate floor, urged the use of Kentucky coal to meet Wisconsin's fuel needs.

Sen. Morton, after hearing Senator Alexander Wiley (R-Wis.) say that Wisconsin industries lack sufficient fuel supplies, and that early pipeline construction was hoped for, invited "the Wisconsin senator's attention to the fact that the price of Appalachian coal at the base of the mine is the same today as it was in 1948." Sen. Morton pointed out that "plans to move Appalachian coal to fire the boilers of Florida utilities" are being worked out.

The Kanawha Coal Operators Association reports that coal production in the Kanawha and Coal Rivers area of West Virginia is up nearly a million tons over last year.

The association says that through August 4, 1956 the region produced 10,547,500 tons. Through August 3, 1375 the region turned out 11,268,300 tons.

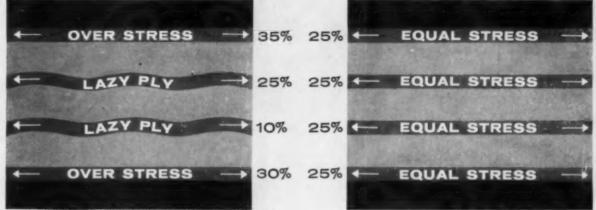
Terming the coal industry a "sick" industry, a special congressional committee recommended a greatly expanded research and development program.

The committee, headed by Rep. Edmonson (D-Okla.) declared that there exists an "overall picture of economic ills, widespread mine shutdowns, staggering unemployment among coal miners and an uphill struggle for survival." Created by a resolution introduced in Congress by Rep. Saylor (R-Pa.), the committee based its report on hearings held in Washington, Wilkes-Barre and Evensburg, Pa., Abingdon, Va., Henrietta, Okla., and Pueblo, Col.

The committee recommended setting

The committee recommended setting up a government research commission to seek new uses for coal. It also proposed tax changes to aid the industry. The commission would be composed of three members appointed by the President. The three would be appointed on a full salary basis. Their jobs, the committee said, would encompass "a broad gauged research program to develop new uses for coal and improve existing uses."

# Are you paying for lazy plies" in your belts?



Conventional Belt Construction

Balanced Belt Construction

# alanced nstruction Equalizes stress — prolongs belt life

BBG - Balanced Belt Construction equalizes ply stress . . . every ply pulls its share of the load. You get troublefree service . . . greater economy. BBC is a result of two remarkable BOSTON developments: Electro-Tensile Control and Rotocure. Electro-Tensile Control electronically controls stress in the plies during manufacture. Rotocure, the only

continuous method of vulcanization, assures complete uniformity from end

You cannot afford to underestimate the value and importance of Balanced Belt Construction. Your BOSTON man is ready to demonstrate how BBC pro-longs belt life, minimizes downtime, saves you money!

BOSTON

BOSTON WOVEN HOSE & RUBBER CO. BOSTON 3, MASSACHUSETTS







BELTING



V-RELTS.



PACKING



MATTING



TAPE



### Personal Notes



DeVine Joins The C&O

Gregory S. DeVine, executive vice president of Peabody Southern Coal Co. and president of the St. Louis Coal Sales Co., joined the Chesapeake & Ohio Ry. September I as a vice president. Before his association with Peabody in 1956 Mr. DeVine had been with the Truax-Trate Coal Sales Co. and its predecessor, the Binkley Coal Co., for 22 yr. During the time he was with Binkley Coal he was its president. Prior to that he had been a member of the sales divisions of the Chicago By-product Coke Co. and the Koppers Co.

Mr. DeVine is president of the Midwest Coal Producers Institute, a director of the Illinois Coal Traffic Bureau, a former executive director of the American Coal Sules Association, and a former director of the Indiana Coal Traffic Bureau.

James H. Cunningham, director of public relations for the National Coal Association, resigned August 15. He will be succeeded temporarily by David F. Brittle, public relations staffer and editor of the NCA Industry Bulletin. Mr. Cunningham joined the Bituminous Coal Institute in 1948 as director of the speakers' bureau and assistant director of the educational division. He became director of public relations after the retirement of the late Ralph C. Mulligan. Mr. Cunningham's future plans have not been announced. Mr. Brittle joined NCA in 1949 as advertising manager of the Coal Heating Service Div. He moved to the NCA's Public Relations Dept. as editor in May, 1955.

Joseph S. McClellan, former assistant superintendent of the Itmann, W. Va., mine, Pocahontas Fuel Co., was appointed superintendent of the company's Bishop, W. Va., mine. Mr. McClellan succeeds Charles T. Stephenson, who had been superintendent since May, 1958. Mr. Stephenson has been assigned to special duties in the general superinten-

dent's office. Mr. McClellan joined Pocahontas Fuel Co. at Itmann in 1951 after accumulating 17 yr of experience among coal operating companies in eastern Kentucky. At Itmann he began as a section foreman, moved to assistant night foreman, then general mine foreman and, finally assistant superintendent. Mr. Stephenson joined Pocahontas Fuel in November, 1938 as section foreman. In 1948 he was appointed superintendent. Before employment with Pocahontas he had worked for the Yukon Pocahontas Coal Co. and the Pond Creek Coal Co.

George W. Kratz, financial vice president of Pittsburgh Consolidation Coal Co., retired after a 50-yr career with the company and its predecessors. Mr. Kratz, however, will continue to serve as a director and as a member of the company's executive committee. His career with Pittsburgh Consolidation began in 1907 when he was hired as a messenger and office boy by the Consolidation Coal Co.'s Accounting Dept. In 1939 Mr. Kratz was elected a vice president. In 1945, after the formation of Pittsburgh Consolidation, he was elected again to hold the same office.

### **Obituaries**

William G. Duncan, Jr., president of the W. G. Duncan Coal Co., Greenville, Ky., died August 9 in Louisville after a brief illness. He was 71. Mr. Duncan had been president of the W. G. Duncan Coal Co. since 1943. He began a career in mining coal in 1907.

### Meetings

National First Aid and Mine Rescue Contest, Oct. 2-4, Kentucky Fair and Exposition Center, Louisville, Ky.

AIME, ASME, 20th Annual Joint Solid Fuels Conference, Oct. 10-11, Chateau Frontenac, Quebec, Que., Canada.

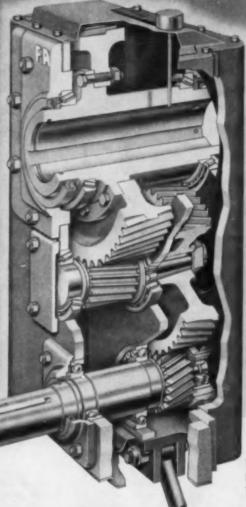
Illinois Mining Institute, Oct. 18, Abraham Lincoln Hotel, Springfield, III.

National Safety Council, 45th Annual Meeting, Oct. 21-25, Conrad Hilton Hotel, Chicago, III.

Kentucky Mining Institute, Annual Meeting, Oct. 31-Nev. I, Phoenix Hotel, Lexington, Ky.

Petroleum Society, Mining Society, and Metals Society of the Pittsburgh Section, AIME, the Engineers' Society of Western Pennsylvania and the Pittsburgh Section of the National Open Hearth Committee; 12th Annual Off-The-Record Meeting, Nov. 1, Pennsheraton Hotel, Pittsburgh, Pa.

# New...LARGER...ALL-STEEL! -the FALK 3151 Shaft Mounted Drive



- o for higher horsepower
- o for lower output speeds

THE NEW 315J... FROM 2 HP AT 5 RPM TO 50 HP AT 359 RPM

### Check These Features

1011 - 3-wall, one-piece housing provides double the ability of cast iron to withstand external impact or shock loads.

> ratio range-5:1, 14:1 or 25:1. Higher ratio range makes possible lower output speeds...smaller sheaves...standard, rather than slow-speed, motor.

ease of maintenance. All revolving elements can be easily replaced in the field. on the jobsite! Inspection covers permit quick inspection of gears and bearings. Dipstick provides quick check on lubricant.

longer center distance between shafts allows use of larger sheave on input shaft. Unit may be mounted with input shaft next to driven machine, and with motor mounted directly under driven shaft.

### PROMPT DELIVERY

Standard units are available for off-theshelf shipment from factory, warehouse or distributor stock.

### LET US HELP YOU

Your Falk Representative or Authorized Falk Distributor will gladly review your applications and offer suggested selections\_without obligation.

Write for Bulletin 7100

(981/2% per gear mesh) of helical gears for maximum power utilization. Through-hollow shaft design for easy installation, with internal groove to

also gives you these famous Falk advantages—

Falk extra-depth, extra-capacity gear teeth—plus the extra efficiency

permit use of bearing puller when dismounting unit. Hollow shaft also permits use of unit on through-shaft applications.

The new Falk 315J

Tie rod fastened to steel housing by steel bracket with bolt in double shear. Shock load on tie rod will not damage housing.

### THE FALK CORPORATION, MILWAUKEE I, WISCONSIN

Representatives and Distributors in Most Principal Cities Manufacturers of Quality Gear Drives and Flexible Shaft Couplings ...a good name in industry

NEW SPEED AND DRILLING ECONOMY
WITH THE NEW IMPROVED

# Parmanco

MODEL CD-51-57

### COAL AND CLAY DRILL



- Augers Rotated by Vickers 21.5 H.P. Fluid Motor with Hydraulic Feed Finger Tip Controlled
- Cutting Shield And Guide Completely Automatic
- . Drill Powered By 65 H.P. Water Cooled Motor.

Jack Foehrer, Pit Foreman says

"THE PARIS DRILL IS THE BEST WE HAVE EVER USED."

SEND FOR COMPLETE DETAILS

PARIS MANUFACTURING CO.

PARIS, ILLINOIS

### CONTRACT CORE DRILLING

EXPLORATION FOR MINERAL DEPOSITS

FOUNDATION TEST BORING . GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY

MANUFACTURING CO.

Contract Core Drill Division
MICHIGAN CITY, INDIANA

### **Earnings Reported**

Lehigh Coal & Navigation—Net income \$1,383,450, or 63c a share for the 6 mo ending June 30, 1957. In the same period last year net income was \$1,438,433, or 65c a share.

North American Coal Corp.—Net income \$907,672, or 62c a share for the 6 mo ending June 30, 1957. In the same period last year net income was \$949,000, or 65c a share.

Pittsburgh Consolidation Coal Co.— Net income \$13,117,539, or \$1.43 a share for the 6 mo ending June 30, 1957. In the same period last year net income was \$10,386,295, or \$1.15 a share.

West Kentucky Coal Co.—Net income \$757,827, or 80c a share for the 6 mo ending June 30, 1957. In the same period last year net income was \$851,382, or 99c a share.

### **New Books**

#### Rock Blasting

A fifth supplement to the international Manual of Rock Blasting is now available. The new publication deals with the construction and operation of percussion rock drills and the applications of diamond drilling. New supplement \$2.50; manual and fice supplements \$31.50. Atlas Copco Eastern, Inc., 151 Linwood Ave., Paterson, N. J.

#### Welding

Procedure Handbook of Arc Welding Design and Practice, eleventh edition, is a major revision of this welding reference book. A major portion has been completely rewritten and all sections have been brought up to date. The work is divided into eight sections, each of which has its own table of contents. 1,300 pp with 1,100 illustrations. 6x9-in; gold embossed simulated leather. \$3 in U.S.; \$3.50 elsewhere. The Lincoln Electric Co., Cleveland 17, Ohio.

Filler Metal Comparison Charts is a comprehensive set of welding rod and electrode comparison charts put together into a booklet. The brand names of 61 companies are included, twelve AWS-ASTM specifications are involved and two indexes list brands as well as manufacturers' names. This booklet is said to be the most complete ever assembled. 24 pp. 8%x11-in; paper. \$2. American Welding Society, 33 W. 39th St., New York 18, N. Y.

#### Technical Catalog

A new, revised catalog of Lefax Technical Data Books is now available. These pocket-size reference books cover all branches of engineering. Each has about 140 pp. of data. Catalog free, Lefax Publishers, Philadelphia 7, Pa.





### ANOTHER CARLOAD OF FROZEN COAL!

### Reduce such complaints with Peladow

The customer is always right. And in most cases, his complaint can be multiplied. For many customers choose to remain closemouthed . . . and take their business elsewhere in silence.

Why risk losing customers when it's so easy to end frozen coal complaints with Peladow®, the high-test calcium chloride in buckshot-size pellets.

Spray it! Apply Peladow in a water solution as the coal comes off the boom or loading chute. Sprinkle it! Apply Peladow dry at any convenient point prior to loading. Save with it! Order Peladow in 100-lb. moistureproof bags, bulk

hopper cars, bulk tank cars, or bulk trucks. Its high calcium chloride content (94 to 97% concentration) means four carloads equal five carloads of flake type. Save transportation, storage, and handling costs; apply it manually or mechanically.

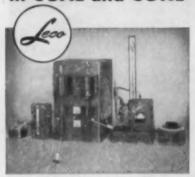
In addition, use Peladow to dust-proof coal and keep it clean, reduce dust in mines, firm up roads and haulage ways. Truly, an all-round product that offers advantages for both you and your customers! Get your copy of the Peladow Manual . . . write the dow chemical company, Chemical Sales Dept. IN-783T-2, Midland, Michigan.

you can depend on DOW CHEMICALS



NOW, in a fraction of present analysis time, determine

# ASH and SULFUR in COAL and COKE



**New High-Temperature Method** 

COAL ASHIME—in 10-15 minutes compared with 1.2 hours for other methods. Coal is pyrolyzed to remove volatiles, then completely oxidized. Results are in excellent agreement with usual procedures.

SULFUR ANALYSIS—in 6 minutes compared to 1-6 hours required by Eschka procedure. Coal sample is burned at extremely high temperature. Sulfur is released as SO<sub>29</sub>, is titrated automatically with a Loco sulfur titrator.

Write for Complete Technical Data!

LABORATORY EQUIPMENT CORPORATION

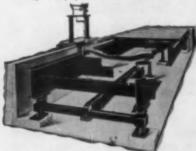
8009 Hilltop Road, St. Joseph, Michigan

### WINSLOW

Dependable — Accurate
TRUCK and TRACTOR TRAILER
SCALES



TYPE "C. S." Portable Scale—easily and quickly set



TYPE "S" Pit Scale-for weighing trucas and tractor

### WINSLOW SCALE COMPANY

Phone for more details, North 6515 Scale Manufacturers since 1896

### Among the Manufacturers

This was the news:

### Earnings Record

Joy Mfg. Co. reported higher earnings for the 9 mo ending June 30 than in any corresponding 9-mo period in the company's history.

Net earnings of \$9,118,521 were produced on sales of \$100,063,722, equal to \$5.10 a common share. During the first three quarters of fiscal 1956 the company earned \$8,039,554, an amount equal to \$4.50 a common share. Sales were \$89,830,729.

### Acquisition Agreement

American Cyanamid Co. signed an agreement with the Illinois Powder Mfg. Co. providing for the sale of Illinois Powder to American Cyanamid.

Under the terms of the agreement, subject to a stockholders' vote August 29, Illinois Powder stockholders would receive 88,000 shares of Cyanamid common stock. American Cyanamid said that Illinois Powder would become a part of the company's explosives department, which is headed by the Organic Chemicals Div. American Cyanamid operates explosives plants in Latrobe and New Castle, Pa. It also maintains 34 magazines in 15 states. Illinois Powder's executive and sales offices are situated in St. Louis, Mo. Its manufacturing plants are in Grafton, Ill., and Gomex, Utah.; its more than 50 magazines are in 24 states.

### Keeping Pace

Atlas Powder Co. disclosed plans to spend \$4 million replacing nitric acid and ammonium nitrate facilities the company maintains at its Atlas, Mo., plant.

Construction will begin immediately to meet an operating deadline of March 1, 1958. The new facilities will enable Atlas to keep abreast of an expanding market for all types of industrial high explosives. The Chemical & Industrial Corp., Cincinnati, Ohio, is designing and constructing the facilities.

The Mine & Smelter Supply Co. and its subsidiary, Colorado Iron Works Co., completed a \$1 million expansion that included a new office building and additional shop facilities in Denver.

The expansion will increase production of Wilfley tables, Massco-Grigsby pinch valves and laboratory equipment. In addition, a new research department is expected to extend research and testing activities.

To double the size of its heavy manufacturing division the Illinois Gear & Machine Co. is spending \$2 million to expand its South Works in Chicago.

More than half the money will be used to buy heavy machine tools. The company manufactures gears weighing from 1 oz to 40 tons.

Flood City Brass & Electric Co., Johnstown, Pa., is expanding its manufacturing facilities by erecting an addition to its present plant.

Approximately 10,000 sq ft of manufacturing area and 3,000 sq ft of office area will be added. The company has been furnishing the mining industry with pumps and replacement parts for half a century.

Stockholders of Reliance Electric & Engineering Co. and the Master Electric Co. approved a proposed merger.

The two companies will be consolidated by exchanging 450,000 shares of Reliance stock for the assets of Master. Reliance produces electric motors and electronically-controlled drive systems. It owns plants in Ohio, Indiana and Canada. Master produces fractional type AC and DC motors, gear motors and special rotating electrical equipment. Its manufacturing plant is in Dayton, Ohio. Master will be operated as the Master Electric Div. The two companies are expected to have a current annual sales volume of \$95 million.

McLanahan & Stone Corp. completed an expansion program that doubled production area at its plant in Hollidaysburg, Pa.

The new facilities are designed to speed deliveries and increase production of the company's log washers, screw washers, feeders and fabricated steel crushers. The cost of the expansion was not disclosed.

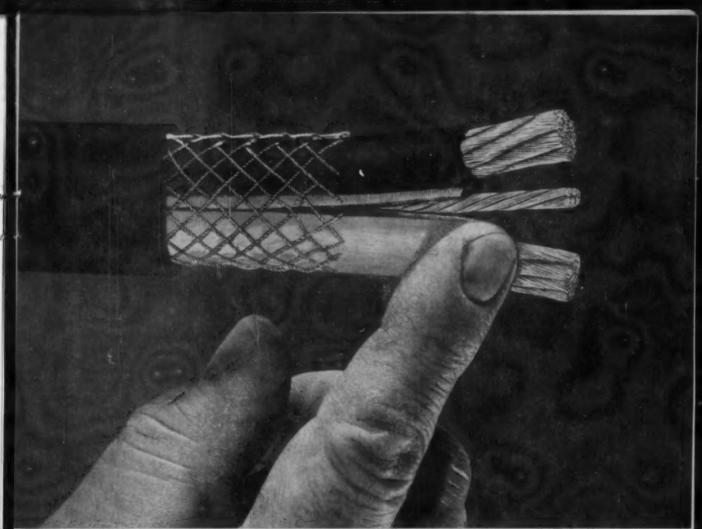
Joy Mfg. Co. announced the affiliation of John P. Courtright as a consultant in strip mining and construction problems.

Mr. Courtright was formerly president of the Marion Power Shovel Co., and has been associated with mining for more than 30 yr. At one time he was chairman of the Mfg. Div. of the American Mining Congress. He also served as a mining industry consultant to the Mining Machinery Div., U. S. Dept. of Commerce, Business and Defense Services Administration.

John P. Kelly was appointed general sales manager of the Industrial Div., Gould-National Batteries, Inc.

Mr. Kelly, former Detroit regional manager, will make his headquarters in Trenton, N. J.

Universal Marion Corp.'s president, James Mullaney, announced the promo-



New flat stranding of grounding conductor prevents broken wires—assures continuity of operation. Full 50% wire delivers maximum electrical protection.

# Only Anaconda's <u>flat</u> 50% grounding wire offers full electrical protection—with small diameter

It takes a full 50% grounding wire to give you needed electrical protection. Anaconda's Securityflex\* Shuttle Car Cable with its service-proven, flat grounding wire provides this protection!

Flat 50% wire, too, offers extra safeguard . . . will not cut insulation if cable is crushed by runovers. And it allows more cable on reel.

Millions of feet of Anaconda Securityflex Cable have been sold without a reported failure of grounding conductor. In addition, Securityflex offers . . .

### 3 NEW ADVANTAGES

1. Rugged high-grade neoprene insulation that greatly increases resistance to puncture, flame and crushing.

- **2.** Improved stranding of ground and power conductors that prevents broken wires—assures continuity of ground and power conductors.
- 3. Nylon breaker strip that increases short-circuit protection . . . and nylon seine twine jacket reinforcement that prevents wicking of moisture, gives jacket greater tear resistance.

Insist on full-size grounding conductor for safety—insist on Anaconda Shuttle Car Cable. At regular prices. See the Man from Anaconda or your distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

ASK YOUR ANACONDA DISTRIBUTOR FOR MINE CABLE



### Manufacturers (Continued)

tion of Adrien F. Busick, Jr., vice president of engineering, to executive vice president.

Mr. Busick will have complete charge of all functions and operations of the Marion Plants.

David Hefter was promoted to advertising manager of the Ramtite Co.

Mr. Hefter succeeds R. M. Richardson, who is returning to the company's Pittsburgh office as sales and advertising consultant. Ramtite makes plastic, castable and gunning refractories.

W. A. Haley, former research engineer for the U. S. Bureau of Mines in Pittsburgh, joined the mining sales staff of the Caterpillar Tractor Co.

Mr. Haley will work for the Sales Development Div. With the U. S. Bureau of Mines he was a supervising mining methods research engineer. During his career in mining, which began with graduation from the Missouri School of Mines and Metallurgy in 1921, he has worked as a trackman's helper, mucker, miner, engineer and development foreman.

C. W. Mohr was appointed manager of the Industrial Sales Dept., Gustin-Bacon Mfg. Co., Kansas City, Mo.

Mr. Mohr will be responsible for marketing the company's Rolagrip, Gruvagrip and Gruvajoint couplings and fittings. Before joining Gustin-Bacon Mr. Mohr had been sales manager of the Oil Equipment Div., Milwaukee Valve Co., Milwaukee, Wis.

Charles E. Martin was appointed general service manager and member of the executive committee of the Cummins Engine Co., Columbus, Ind.

As general service manager Mr. Martin assumes responsibility for the Service Div. He succeeds H. E. Bollwinkel, who resigned recently. Mr. Martin joined Cummins in 1943. Before the new appointment he had been manager of field service.

Donald F. West was appointed Atlanta district sales manager by Mine Safety Appliances Co.

Mr. West formerly served as a product line manager at the company's main office in Pittsburgh.

Edward F. Hahnfeldt was named Pittsburgh district sales manager by Mine Safety Appliances Co.

Mr. Hahnfeldt will supervise salesmen in western Pennsylvania, southeastern Ohio, West Virginia and counties in Kentucky and Virginia.

Leslie H. Todd was appointed deep mine explosives engineer by the Austin Powder Co.

For 22 yr Mr. Todd has been either

# INALEX

# SAND

DEFY ABRASION . . CORROSION



It has been proven that:

Linatex Sand Pumps will outwear any other sand pumps in the world.

All wearing parts are covered with long lasting, abrasion resistant LINATEX.

If you are responsible for an efficient pumping operation at your plant, write for further information on the LINATEX

Made in 10 standard sizes from 1 to 12 inches. NOTHING LASTS AS LONG AS LINATEX.

Linatex Corporation of America Vernon Ave., Rockville, Conn.





Mining contractors, ore prospectors, coal operators and construction firms are realizing tremendous savings by taking advantage of our exclusive fabrication service! Contractors send us the necessary diamond stones from their own stocks—we hand set them in a super-hard tungsten carbide crown and braze to the threaded steel blank. Hand-set bits assure the proper positioning of each diamond stone to achieve maximum cutting efficiency. The carbide matrix holds the diamond stones until entirely used up. These advantages mean lower drilling costs to you. We can also supply complete core bits or salvage the stones from used bits at nominal cost. Supplied in standard sizes EX, EXE, AX, BX, NX, etc.

> Metal Carbides Corporation Youngstown 7, Ohio



Talide Tips for Mining Tools Give These 3 BIG ADVANTAGES . . .

I. EXTRA STRONG

2. SUPER HARD

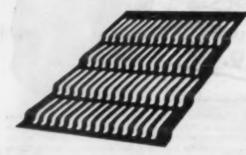
3. SHOCK RESISTANT



 A complete line of low-cost, high-quality Talide Tips is offered fabricators and users for tipping machine bits, rock bits, drill bits, roof bits and open-pit bits. All Talide Tips have a special surface finish that facilitates brazing. Non-standard shapes and sizes quoted on request.



## MORE COAL YOUR GOAL?



Specify Hendrick Flanged Lip Screens

Vibrating screens that blind toe often can knock a big hole in production schedules. But here's an easy out . . . try a Hendrick Flanged Lip Screen!

Hendrick screens provide better separation and practically eliminate costly delays

caused by blinding, Ideal for shaking and gravity screens and discharge chutes. Flanged Lip Screens are furnished with openings from .010 x .025 x  $\frac{1}{2}$  (equivalent to  $\frac{1}{32}$ " Round) to  $\frac{10-\frac{1}{2}}{2}$  x  $\frac{11-\frac{1}{2}}{2}$  x 13 (equivalent to  $\frac{16}{2}$ " Round).

### Hendrick

### MANUFACTURING COMPANY

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring — Shur-Site Treads • Armogrids • Hydro Dehazers • Petrochemical Column Internals

**41 Dundaff Street** 

Carbondale, Pa.



It's the bonus quantity of Neoprene—67.32%, certified by a registered professional engineer—in the outer protecting jacket that gives Bronco 66 Certified its extra toughness, greater resistance to oil, ozone, sunlight, makes it more flame-proof, more resilient and flexible.

SOLD NATIONALLY BY ELECTRICAL WHOLESALE DISTRIBUTORS

manufactured by

WESTERN INSULATED WIRE CO. LOS ANGELES 58, CALIFORNIA Manufacturers (Continued)

a coal mine manager or superintendent. During those years he was associated with the Pacific Coal Co., Central City, Ky.; the Hart Ross-Cardinal Coal Co., Madisonville, Ky.; the Nashville Coal Co., and the West Virginia Coal Co., Madisonville. His office with Austin will be in Madisonville.

The Eimco Corp. assigned Denny F. Warnock to the company's Chicago regional office in Palatine, Ill., as midwestern sales specialist.

A former southern regional sales manager for American Tractor Corp., Mr. Warnock has also been general manager of the Southern Gateway Co., Cincinnati construction equipment company. In his work with Eimco Mr. Warnock will direct sales and service on Eimco 105 tractor-excavators, dozers and front end loaders.

The Fuller Co. entered the field of dust collection and recovery by buying the Dracco Corp., Cleveland, Ohio.

Fuller, which is situated in Catasauqua, Pa., manufactures pneumatic handling equipment, and is a subsidiary of the General American Transportation Corp. Dracco manufactures continuous and intermittent collectors; collectors for acid and alkaline dusts; glass cloth collectors for high temperature gases; and high efficiency cyclone types. The purchase price of Dracco was not disclosed.

Carl Ludwig was made chief engineer of the Engineered Products Div., Wellman Engineering Co., Mc-Dowell Engineering Co., Cleveland.

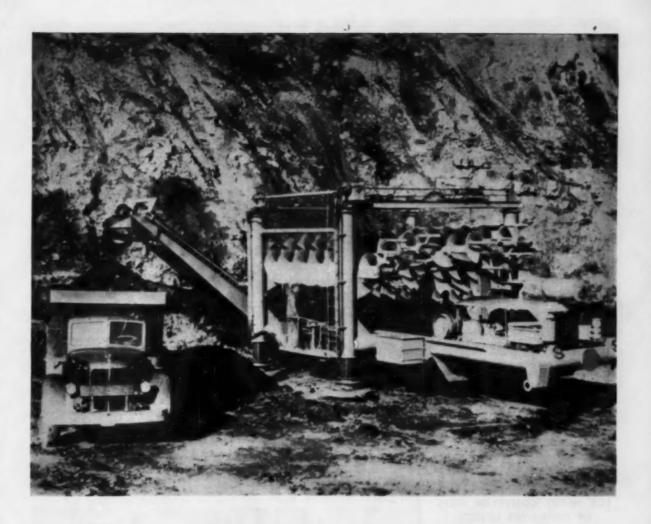
Mr. Ludwig joined Wellman in 1956. Prior to 1956 he had held a variety of responsible jobs in the heavy engineering industry with such companies as the Rolling Mill Div., Winchester Arms and the Adamson Div., Hydropress, Inc.

Femco, Inc., announced the promotion of John W. Bauer, Jr., to the newly established post of sales manager.

For the past year Mr. Bauer had been district sales manager of the company's western Pennsylvania sales area. Prior to that he had been a sales engineer for 8 yr. Mr. Bauer's headquarters will be at Femco's main office in Irwin, Pa., from which will be conducted an expanded nationwide sales program for the company's electronic communication and control systems for industry.

Lee Supply Co., Charleroi, Pa., was appointed a distributor of Carboloy cemented carbide mining tools.

The company's territory includes western Pennsylvania and southeastern Ohio. The appointment was made by the Metallurgical Products Dept., General Electric Co., Detroit. Cutter, auger drill and roof drill bits will be sold by Lee.



### AMOCO BLANKETS EVERY DIESEL LUBRICATION NEED!

There's an Amoco lubricant for your every diesel lubrication need. AMOCO HDX, a high-detergent, non-corrosive, non-gumming engine oil... and a full line of Amoco Superior Diesel Oils, S1, S2 and S3 for special operating conditions. Amoco Diesel Lubricants are refined to super strength. Engines start easier...stay Amoco-protected. You get better performance, longer diesel life, with Amoco lubricants!



FOR MINE MACHINERY



AMERICAN OIL COMPANY

Higher Quality...for Better Lubrication...at Lower Cost

FOR CONFINED AREAS

ALSO AVAILABLE IN FLOOR TYPE



### RUGGED and ECONOMICAL TOO!

WHEN the space is hard to heat — such as a crane or locomotive cab, a pump house or small office — a GUYAN natural convection heater is the answer. It is a DEPENDABLE, LONG-LIFE HEATER consisting of corrosion-resistant aluminum chromium wire -- wound on ceramic forms and mounted within expanded steel housings.

customary in tough industrial applications. Available from 1,500 thru 7,500 watts for 110, 220, 440 volts DC or AC. Priced right — more economically than you might think — and lower than you can make your own. Write for complete information.

GUYAN MACHINERY CO. LOGAN, WEST VIRGINIA

GUYAN Heater Units are ruggedly built to stand the hard service that is

### Letters

Pikeville, Ky.

EDITOR Coal Age

For more than a century we have thought only that mining coal was no more than a job that had to be done beneath the earth's surface. But today we must look far beyond the immediate horizon, to the fruits of an event at the end of the 19th century, when Marconi signaled a few miles over a radio circuit. Did any one think or realize then that at some time Marconi's invention would prove to be a great help in mining coal? Probably not. But as the years go by, the coal industry finds more uses for Marconi's discovery. In fact, modern coal operations today use his discovery as a time saver and safety measure as well as a cost-cutting device.

The coal mine carrier-current fre-uency modulated radio – sometimes quency called the trolley phone—has proven to be one of the finest safety devices that can be installed in a modern coal mine. The two-way, high-frequency mobile radio system also can be traced to Marconi. Now, radio circuits control an entire operation. For example, a personnel department can be kept in constant contact with all the operations-deep mines, auger mines, strip mines-at the push of a button. The fields of radio and electronics are just now breaking the ice in the coal industry. More men like Marconi are needed by the industry. Hats off to his great discovery.

Cordell Damron, Miner

### HINGED PLATEGRID BELT FASTENER No. 500

### FOR HEAVY CONVEYOR BELTS OF CHANGING LENGTH

These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from 36" to 1/2" thickness. They offer special adrantages in mines, quarries or industrial setups where length or position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this purpose by simply pulling out the hinge pin.

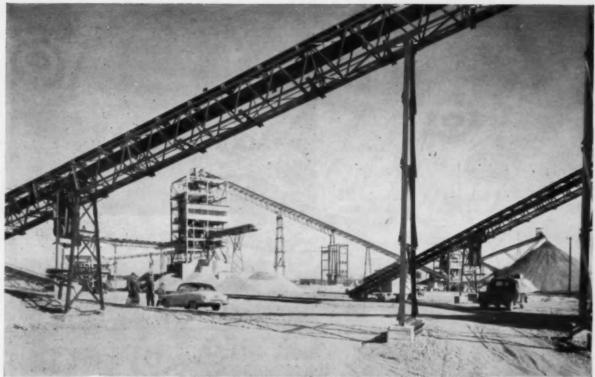
Easily and quickly applied on the job or in the shop. Special design gives deep compression into belting and smooth, flush joint.

Write for Circular





MINE SAFETY APPLIANCES CO., which posted a record 8 million man-hours without a lost-time injury, was recently presented with the National Safety Council's award of honor for the "best safety record in the optical, photo and scientific industry." Holding the award are E. G. Sanner (left), vice president of MSA, and George H. Deike, Sr., chairman of the board.



This shows a portion of one of the year's outstanding conveyor jobs . . . Consumer's Company, Crystal Lake, Illinols,

# It's not true that Barber-Greene invented the belt conveyor

. . . but it is true that Barber-Greene introduced the greatest advance in belt conveyors since their invention —standardization.

Before Barber-Greene entered the field in 1916, belt conveyors were economical on paper—costly to build. Most installations were tailor-made, involving slow single-unit production . . . expensive field engineering . . . complicated assembly.

Then Barber-Greene developed a unique system of standardized conveyor components that quickly outdated ordinary methods of erection, operation and maintenance. Soon standardized conveyors were known for:

Foster delivery. Packaged units come from dealer stock or are immediately available from the factory.

Low-cost erection. Conveyors get into operation sooner with big savings in engineering costs.

Unmatched flexibility. Interchangeable parts simplify lengthening or shortening of conveyors to meet changing needs.

Today, standardized components are practical for in-

stallations of nearly every length, width and capacity. Where yer used, they give a new meaning to conveyor economy, utility and flexibility.



Drives, take-ups and similar units are completely assembled, aligned and adjusted by experts at the factory to assure trouble-free operation.

Write for literature or contact our conveyor division for details on your conveyor problem.

eene &

Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS ... LOADERS ... DITCHERS ... ASPHALT PAVING EQUIPMENT

COAL AGE . September, 1957

109

56-39PE





# One sweep\*

leaning up several miles of track, once over, peld for original cost of machine. (Name on request.) Hydraulic controls of digger plate and side plavs expedite a thereugh cleaning job in one pass. Mine inspectors insist on clean houlege roads. Hazards of unsure footing and accumulation of explosive dust are minimized by cleaning the houseness were with the "Conton".

sure footing and accumulation of explosive dust are minimized by cleaning the haulage ways with the "Conton" Custom-made to specifications. In use . . . coal, iron, copper, potash, load and salt mines, also smalter skim tracks.

### American Mine Door Co.

2057 DUEBER AVENUE

CANTON 6, OHIO



- New re-usable Haze-lok fittings for single- and double-wire braid rubber-covered hose are easy to make up. You don't have to strip off the hose cover... you can even assemble most sizes with only a hand wrench.
- Two simple steps: (1) dip end of hose in light grease, such as Parker Threadlube, and turn counterclockwise into socket; (2) dip nipple in Threadlube and screw into socket and hose.
- · Hoze-lok holds beyond hose-bursting pressures . . .
- . Ask for NO-SKIVE Hoze-lok Catalog 4433.



Order from your Parker Distributer — or Tube & Hose Fittings Division, Section +27-6 The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio



A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet,"

McGraw-Hill Publishing Company, Room 2710, 330 West 42nd St., New York 36, N.Y.

DEEP MINING

STRIPPING

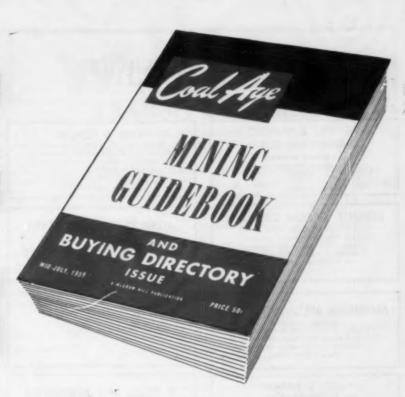
COAL PREPARATION

MAINTENANCE

SUPPLIES

SAFETY

BUYING DIRECTORY



No Matter
No Matter
The COAL AGE Mining Guidebook
and Buying Directory Issue
is a useful,
practical working manual

The largest, most complete single source of information on current mining practice available anywhere, the COAL AGE "Guidebook" will help you develop new ideas, a fresh slant on operating problems, the latest mining methods and equipment.

The 62-page Buying Directory lists for speedy reference all the known manufacturers of over 1,200 products used in coal mining, completely revised and up-dated for the 1957 edition. This comprehensive guide, along with the manufacturers' advertising and the Index to Advertisers' Sales Offices and Distributors, will help you quickly locate the nearest source of equipment, materials and services meeting your particular needs.

KEEP YOUR 1957 GUIDEBOOK HANDY ... USE IT REGULARLY

### PROFESSIONAL SERVICES

### NEWELL G. ALFORD

Consulting Mining Engineer

Coal Property Prosperting Development, Operation and Valuation

Pittsburgh 22, Pa

### ALLEN & GARCIA COMPANY

42 Years' Service to the Coal and Salt Industries and Consultants Construction Engineers and Managers Authoritative Reports and Appraisals 332 S. Michigan Ava., Chicago 120 Wall Street, New York City

### AMERICAN AIR SURVEYS, INC.

TOPOGRAPHIC MAPS FOR MINING AERIAL PHOTOGRAPHS 907 Penn Ave., Pittsburgh 22, Pa. Phone EXpress 1-3969

### GEO. S. BATON

Consulting Engineers Cost Analysis — Valuations
Mine and Preparation Plant Designs
1100 Union Trust Building Pittsburgh 19, Pa.

### JOHN J. BORDERS

ne Roof Support Const Construction Co. Roof Boiling — Time Study forn Production Methods Analysis forceto Construction & Design Foreign and Dossestic Pass, Illinois

#### EAVENSON, AUCHMUTY & GREENWALD

Mining Engineers COAL OPERATION CONSULTANTS VALUATIONS 2720 Koppers Bldg. Pittsburgh 19, Pa-

#### THERON G. GEROW

Mining Consultant and Engineer

111 North Wabash Avenue

Chicago 2, Illinois

### HOFFMAN BROS. DRILLING CO.

Drill Contractors Since 1902 Specialists in exploratory—great hole and pressure greating. Rigs located in over 50 strategic areas for prompt service. Free estimates. 104 Coder St. Punzsutawney, Ponna.

#### HURLEY & ZELLER

Mining Consultants

Industrial Singineering Programs Satabilished Methods Analysis-Fersman Training-Cost Omirol 2000 Hart Street Charleston, W. Va. 1834 Sunshine Ave own. Ps.

### KIRK & COWIN

Ralph R. Kirk Professional Engineers Consulting—Reports—Appraisals
Mechanical Mining of Ore & Coal
Management and Construction of Mines
1—18th St., SW—Birmingham, Aia.
Phone 56-5566

### HERBERT S. LITTLEWOOD

Consulting Electrical Engineer

Irwin, R.D. #3, Pen

### J. B. MORROW

Coal Consultant

Oliver Building

Pittsburgh, Pa.

### K. PRINS AND ASSOCIATES

Engineers and Consultants Coal Preparation-Layouts and Construction Designs Wellston, Ohio phones 4-3355-4-2393

### DAVIS READ

Consulting Engineer

Layout — Operation Madern Production Methods Plant Design — Preparation

120 S. La Salle St.

Chicago 3. III.

### ROBINSON & ROBINSON

Consulting Engineers Mine Operation — Proparation Coal Property Valuation Industrial Engineering

Union Bldg.

Charlestown, W. Va.

### J. PIERRE VOGEL

Coal Property Investigation Coal Preparation

Oliver Building

Pittsburgh, Pa.

#### I. W. WOOMER & ASSOCIATES

Consulting Mining Engineers Mattern Mines Systems and Designs Foreign and Domestic Mining Reports Otiver Building-Mellon Square Pittsburgh, Penns

#### PAUL WEIR COMPANY

Established 1936

Mining Engineers & Geologists DESIGN AND CONSTRUCTION

20 North Wagker Drive

Chicago 8, Illinois

CARST

### HOW I USE COAL AGE

### By the President Of a Major Kentucky Company

"You won't find copies of COAL AGE among the papers and magazines on that the president of an important coal producer told us during a recent visit to his office.

"Like any busy executive, one of my real problems is to keep informed on what's going on in the industry, to keep ahead of machinery developments, economic trends, what the other fellows are doing. I find COAL ACE invaluable for that purpose-informative, . authoritative and easy to read."

"COAL AGE is one of only three magazines I have sent to my home. There I have time-without interruptions, or very few-to really cover each month's issue as it comes out.

"It's simply that I've got far too much reading and far too little time here in the office. For me, COAL AGE is must reading. I know of no better way of keeping up to date on the industry. So I get COAL AGE at home, to be sure I have time for it."

If you're not seeing COAL ACE regularly or have to depend on an officerouted copy, why not take a tip from this top-flight mining executive and subscribe for your own copy today. A year's trial subscription costs you only \$3-a mighty small investment for the 1,000 editorial pages of industry news, mine descriptions, operating, technological and equipment data you'll get. Of course, we'll send COAL AGE wherever it's best for you, home or office.

Start right now and see how reading COAL AGE every month can put you on top of the important mining developments and help you do a better job.

### USE THIS COUPON

COAL AGE, Subscriber Service
330 West 42nd St., New York 36, N. Y.
Send me COAL AGE for 1 year at \$3 (U. S.
and Canada only)
☐ Check enclosed ☐ Bill Company
☐ Bill me
Name
Mailing Address:   Home Business
City Zone State
Mining Compuny
Your Position

Hdqs. or Mine Name 4.....



Established 1872

# VILSON ARINE

### TRANSIT COMPANY

OWNERS, OPERATORS, AGENTS

WORLD-WIDE BULK CARGO SERVICE

Ship Agents for bulk cargoes to and from any port on the Great Lakes and St. Lawrence River. Coal export enquiries invited.

West River Ore Transports, Ltd., Agent 455 Craig Street, West Montreal, P. Q., Canada Telephone: UNiversity 6-4969 Cable: WESTORE

360 Rockefeller Building Cleveland 13, Ohio, U.S.A. Telephone: MAin 1-0804 Cable: WILTRANCO Telex: CV 677

### Help in Buying . . . Who Makes It . . . Where Are They

YOU'LL FIND A COMPLETE CROSS-SECTION of the modern equipment, materials and services offered by manufacturers and service organizations is presented in your Mid-July 1957 MINING GUIDEBOOK issue of Coal Age.

The Buying Directory Section is designed to help you in three major ways:

- 1. If you need equipment, materials and services not previously used . .
- 2. If you are interested in additional sources of equipment, materials and services . .
- 3. If you are developing a new idea in production, prepa-

ration and safety and want to see what's available for carrying it out . . .

Check the Buying Directory beginning on p 289. Find the product in the alphabetical list. Under it will appear the names of the key manufacturers, with those advertising in this issue indicated by black-faced type.

Consult the manufacturers' advertisements in this issue for information on specific products, materials and services. To locate the local source of supply nearest you, check the list of advertisers district sales offices and distributors provided at the end of this issue.

### SEARCHLIGHT SECTION ADVERTISING

CLASSIFIED

EMPLOYMENT . BUSINESS . OPPORTUNITIES . EQUIPMENT—USED OF RESALE

#### UNDISPLAYED RATE:

\$1.50 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

POSITION WANTED undisplayed advertising rate is one-half of the above rate payable

NUMBERS count as I line additional.

DISCOUNT OF 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals). EQUIPMENT WANTED OR FOR SALE Advertisements acceptable only in Displayed Style. AN ADVERTISING INCH is measured ½ loch vertically on one column, 3 columns—30 inches

DISPLAYED RATE:

The advertising rate is \$12.50 per inch for Equipment and Business Opportunity advertis-ing appearing on other than a contract basis. Contract rates quoted on request.

EMPLOYMENT OPPORTUNITIES-\$21.00 per

Send New Advertisements or Inquiries to Classified Advertising Div. of Coal Age, P. O. Box 12, New York 36, for October issue classing Sept. 19

### WANTED ROTARY CAR DUMPER FOR STANDARD GAUGE CARS

USED IN GOOD CONDITION SET UP OR KNOCKED DOWN

#### PARR-RICHMOND TERMINAL

1-Drumm St.-San Francisco 11 Telephone DOuglas 2-5656 Teletype Sif 724

### SUPERVISOR

Pittsburgh Consolidated Coal Company, leader in research and development in the coal industry, is currently building a coke testing laboratory. We have an immediate opening for a B.S.-M.S. technical graduate to supervise the work of the new laboratory. Candidates' experience should include 2-5 years in work of a similar nature with small scale coking and testing procedure.

### COKE TESTING LABORATORY

Salary will be comqualifications. Please send resume, including education. experience, salary desired and refer-

ences, to: W. F. SAALBACH

### PITTSBURGH CONSOLIDATION COAL COMPANY

Research and Development Division Library, Pennsylvania (13 mi. South of Downtown Pittsburgh)

If there is anything you want that other readers can supply something you don't want-Advertise it in the SEARCHLIGHT SECTION



HOTORS . GENERATORS TRANSFORMERS ELD'S LARGEST INVENTORY NEW - REBUILT

ELECTRIC EQUIPMENT CO. P. O. Box 51 ochester, New York

### Proven COST REDUCTION **PROGRAMS**

for the Coal Industry HELMICK & ASSOCIATES

### MINING MACHINERY FOR SALE

	CLESS EQUIPMENT
(C)	I—14BU 7CE Joy Loader I—14BU 3PE Joy Loader
(C)	2-14BU 7RBE Joy Londor w/38J motors -Excel ent
(CAW)	3-128U SE & 7E Joy Londors rebuilt and
(CAW)	2-88 U 500 Valt DC
(CAW) (W) (C) (C)	2—Myers Whaley, #3, Loader 2—65C Joy Shuttle Cars 3—10SC Joy Shuttle Cars built 1900 ex-
	col ont condition & modern 4—32D Joy Shuttle Cars
(O) (W)	I-32D Jey Shuttle Car, rebuilt 4-32E10 Jey Care—Rebuilt 1-32E16 Jey Shuttle Car
(6)	1—320 Jeffrey, rubber MTD. 1—PLI(—7PE Joy Elevator
(C) (W)	2-40 h.s., Aemo self propolled air com-
(C)	Pressors permissible

#### BELT CONVEYORS

3—MTB 39" Jay, 49 h.g., permissible tandem drives, w/3800' of MTB structure & 12,000' of Geodycar Coal Flo betting. All material is like new & we will sell conveyors in any longth desired.

1—Berber Groom 30" courayer, 2800' conters, extra beavy construction for outside installation. This solt was sood a very short time & may be soon in operation.

#### CONVEYORS

CONVEYORS
(W) 2000-30" conveyor belling—good condition
(C&W) 6-20" Howitt-Robbins & Jey belt conveyor, complete
(W) 2-96A Goodman, 24" conveyors approx.
(C&W) 15-61AM, 61EW, 61HG, & 61W Jeffrey

y chain conveyors permissible y chain conveyors permissible , 615 & 629 Goodman G17)
-600 Jeffrey Rope & Button
-256', 40' Serajer Conv.
-256', 40' Serajer Conv.
-506' Center, 42' Belt conv. for tipple.
We have material to make up any
Jongth decired up to 500'
-27' x 35' Loading Secons
-42' x 35' Loading Secons
-48' Loading Secons

#### CLEANING PLANT

### CUTTING MACHINES

CUTTING MACHINES

(Oa.W) 4—74 U Track MTD. Sullivans

(W) 4—78 Sullivans
(W) 7—18 Sullivans, 35 & 59 H.P.

(C) 1—1203 Goodman, 229/440 Volt

(CAW) 16—2428 & 12.4A Standard Goodmans

(W) 1—2123A Baby Goodman, 220/440 Volt

(W) 1—2123S Baby Goodman, 220/440 Volt

8—512 Goodmans, 2-w/bespiorters, 81; "bars 2—712 Goodman, 42" Ls. 1—934 Goodman, 42" Ls. 1—395 Jeffrey, 229/440 Volt 42" Ls.— sacellant (C) Stoellent 1—29 Jeffrey Rubber, MTD.
(C) SSIB Jeffrey Coal Cutters w/bupdusters—excellent condition
(CAW) 23—358 A SSB Jeffrey as is or rebuilt, w/stob axis tracks
(C) JSJ, Jeffrey W/7/5 ber & chain
1—Lat machine trucks for Jeffrey & Good-man MOTIVES

1—4 ten Irosten, 42" t.g., 23" high-rebuilt
1—4 ten 8-39 Goedman, 38" t.g., 25" high
2—4 ten Geodmann, 38" t.g., 25" high
2—4 ten MH96 Jeffreyn
1—4 ten MH96 Jeffreyn
1—4 ten MH96 Jeffreyn, Rebuilt, 42" t.g.,
14—6 ten MH96 Jeffreyn, 42" d. 44" t.g.
15—6 ten MH96 Jeffreyn, 42" d. 44" t.g. or
38" t.g.
5—6 ten HM803 G.E., 25" high
1—6 ten MH825 G.E., 25" high
1—6 ten MH855 G.E., 25" high
1—6 ten MH855 G.E., 25" high
1—6 ten MH96 Jeffreyn, 36" t.g.
15—10 ten MH96 Jeffreyn, 36" t.g.
1—10 ten Goedman, 39" t.g.
1—11 ten Goedman, 39" t.g.
1—10 ten West, 48" t.g.
1—10 ten West, 48" t.g.
1—10 ten Goedman, 39" LOCOMOTIVES MINE CARS

WE ARE ALWAYS IN THE MARKET FOR GOOD USED EQUIPMENT

### ELECTRIC & MACHINE SUPPLY COMPANY

### Mining & Industrial Equipment

Whitesburg, Kentucky, P.O. Box 610—
Phone 2223, Teletype #367

(W) Denotes Equipment Located at Whitesburg, Kentucky

Whitesburg, Kentucky

Clarksburg, W. Ya., P.O. Bex 227—Phone Am. 3-0253, Teletype #CB59

(C) Denotes Equipment located at Clarksburg, West Virginia

BILL CONLEY

MELVIN ADAMS

H. J. (HANK) UBBING

#### RAVEN MINING EQUIPMENT COMPANY

### GOOD USED EQUIPMENT-PRICED TO SAVE YOU MONEY A "Fair Deal" or "No Deal" At "RAMECO"

A "Fair Deal" or "Not 1 G-15 Shaker Conveyor—Column Type Pans 2 61-AM Chain Cenveyors 2 fair field Conveyors 2 Air Compressors 4 D C Bonders—A C Welders 1 D Ton Whse Locomotive 3 Ton Goodman Locomotive 5 Ton Goodman Locomotive 1 Ton Goodman Locomotive 1 Ton Goodman Locomotive 2 Ton Goodman Locomotive 3 Ton Goodman Locomotive 6 GE 825 Locomotive 26" Abeve Reil 1 MH 96 4 Ton Locomotive 1 MH 98 6 Ton Locomotive 1 Drag Cable Motor Rubber 1 Tired 1 5 by 7 Rubbertired Mine Car Fairbanks Morse Mine Car Scales with Streeter—Amet Recording Device Tipple Equipment—Main Shaker, Assorted screens Feeder, Loading Booms, Conveyors, Elevator Classifying screens, Car Retarders, Tipple Parts Allis Chalmers Car Shakocuts. Jeffrey Tandem Hydro-Separator Belt Loading Boom Tipple Conveyors of all types Jeffrey 30 x 30 Crusher Brown Fayro Car Spotters, AC motors 3—50 Ton Coal Silos Complete Oil Treating System Trolley Wire & Fittings 1 9000 Gal Storage Tank (Tank Car Type) 1 1600 Amp Automatic Breaker AC and DC Motors—Air Cooled Gas Engine Come To See Us—Highway 460—N&V Cone Alie from Richlands Vicainia Air Deal" At "RAMECO"

Locomotive Tires—New & Used Supplies
Treated Power Poles & Fittings
Mine Cars 23" Above Rail—End Dump
Shop Equipment—Chain Blocks
1 G-12½ Shaker Conveyor—Sire 1 Pans
2 Face Conveyors
3 Sullivan Hoists—5 HP—Rope 100 Feet
Per Minute
Edison Lamps—Chargers—Electric Still
3 212-AA Goodman Machines—A. C.
212-AA Goodman Machines—A. C.
312 Goodman Machines
35BB Jeffrey Machine
1 S-B1 "Buddy" Sullivan 15 HP DC with Truck
6½% Bar 1 CR-10 Sullivan
1 S-B1 "Buddy" Sullivan
1 S-B1 "Buddy" Sullivan
1 S-B1 "Buddy" Sullivan
1 Phillips Cross-Over Dump
1 2 by 6 De-Watering Screen
3 50 KVA Transformers
3 75 KVA Transformers
2 06 252 Switches
5 Steel Ties 48 and 44 Gauge Plates and Angle
8 Bars
Sub Stations—Complete
Coal Drills—Drill Press—Grinders—Pumps—
Blowers—Fans—Jacks
Retrackers—Electric Mine Car Grease:
Trucks & Poov Trucks for Goodman
212-AA and Standard Machines
Extra Armatures—Locomotive Trucks

/ Railways—We Will Try To Help You

Come To See Us—Highway 460—N&W Railway—We Will Try To Help You One Mile from Richlands, Virginia Airport—elevation 2000—Rumway 1800
C. T. Adair, Mail—Raven, Virginia—Wire—Richlands, Virginia
Telephone—Richlands, Virginia—Day 5505—Night 5521

NEW and REBUILT STORAGE BATTERY

### LOCOMOTIVES

to 10 Tone 18" to \$6\\\ Treek Gauge Greensburg, Pa.

New and Used Mining Equipment Crushers, feeders, conveyors, tipples, locomotives, mining machines & fans.

The Industrial Machine & Electric Company T. E. Davies, Owner

PO Box 1107, Morgantown, W. Va. Phone 5764

### POWER EQUIPMENT CO. PRICES GUARANTEED NEW and Rebuilt MOTORS! SEPTEMBER SPECIALS **NEW MOTORS** HP Make Type Speed 50 Wagner-TEFCBB CP-304 900 40 Wagner-TEFCBB CP-405 1800 30 Wagner-TEFCBB CP-444 900 Send for our FREE Catalog

for your surplus new & electric equipment. Send your list teday.

Large line of motors, control equipment, AC & DC Generators, MG sets and transformers.

Phone or Wire Us Collect POWER EQUIPMENT CO. B Cairn St., Rochester 2, N. Y. Phone Genesee 8-5629



inter-communication handsuts, two
wire system. Included Two 3 volthatteries, 50 ft. of wire and simpic wiring instructions, Additional
wirs I coust par ft. or \$25,80 per
mile. Complete list of tolephone
buttery — and fail telephones,
witchbeards, etc. All shipments
FOR Simpson, Penna,
Telephone Engineering Co., Dept. 9-CA.7, Simpson, Pa.

#### FOR SALE

#### CONVEYOR BELT

48" x 7 ply, Used Conveyor Belt-t condition. No heles—No edge wear

Price \$8.00 per foot.
Industrial Rubber Products Co.
815 Court St., Charleston, W. Va.

NEW CURRENT MODELS-IMMEDIATE SHIPMENT FROM OUR FACTORY-WRITE WIRE OR PHONE

### NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS



Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2½" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-os. duck, ½" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

	Rememb	er, You	Save Up	To 50%	— Conveyor	Prices	Include Bo	fting
Belt Width 18" 18" 19"	Length of Conveyor 25' 70' 100'	List Price 81477 3142 4252	Sale Price 8 794 1648 2220	Belt	Length of Conveyor 45' 88' 130'	List Price 82217 3697 F362	Sale	Add or Deduct Per Foot
20" 20"	25' 75'	1517 3467	828 1838	20" 20"	90'	2882 4052	1533 2145	20.37
24" 24" 24"	25° 70° 120°	1790 3480 5580	898 1875 2950	24" 24" 24"	45' 100' 150'	2430 4740 6840	1330 2514 3603	21.78
30"	50°	2911 4831	1617 2614	30" 30"	70' 140'	3871 7281	2119 3852	24.75
36"	25' 60"	1818	1118	36"	45° 100°	2585	1678	27.05

#### NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck 1/4" top rubber cover by 1/32" bottom cover 12# to 15# average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	Ply	List Price	Sale Price	
18"	4	\$4.38 foot	\$3.29 foot	
20"	4	4.83 foot	3.80 foot	
24"	4	5.68 foot	4.26 foot	
30"	4	6.97 foot	5.21 foot	
36"	4	8.26 foot	6.18 foot	

A high grade of heavy duty 4 and 5-ply 28 on duck, '4' top rubber cover x 1/32' bottom rubber cover, 162' to 192' average friction pull, 2500' to 3000' average cover tensilo botting. For more severe service, high tombages and abranion resistant. For handling stone, mineral cree, concrete, cessent, coal and other similar materials, both wet and dry. Beit has moided rubber

		T.i	st	Sal	in.
Width	Ply		ice		ice
18"	4	\$5.23	foot	\$3.83	foot
20"	4	5.73	foot	4.37	foot
24"	4	6.74	foot	4.94	foot
30"	4	8.28	foot	6.07	foot
24"	8	7.90	foot	5.78	foot
Other	widths, plies,	duck v	veights	and e	over
	seses. Available				

### NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5"	diameter	Troughing	Idlers for:
14" belt	\$18.50	24" belt	521.25
			22.00
			22.75
20" belt	20.75	48" belt	25.50
	iameter Re		
	\$7.25		
			9.50
			10.00
20" belt	8.25	48" belt	11.50
A 22		4.6 4.4	

All steel. Interchangeable with other well-known makes, Furnished with easily replacable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible. Write for Bulletin #1138.

### BONDED CONVEYOR ACCESSORIES







Return Belt Guide Idler \$11.75 Carry Belt Guide Idler \$14.50 299.00

#### NEW BONDED® GENERAL DUTY and HEAVY DUTY VIBRATING SCREENS





#### NEW BONDED® COAL CRUSHERS







Bonded double roll crushers are available with single and double drive, in a wide range of roll diameters and face widths. Capacities from small to 500 tons per hour. Tooth roll models are for primary and ascondary crushing of coal from stoker to 8". Will take feed sizes to 24". Teeth are designed to break materials sharp and clean with accurate sizing and a minimum of fines. Bonded double drive crushers are for larger resultant sizes to 8". All models are available with fine corrugated or smooth rolls or any combination of same for crushing Cinders, Pumice, Perlite, Other Expanded Lightweight Aggregate, Chemicals, Limestone Chips, Fertilizer and many other materials.

Bonded Single Roll crushers give you a wide range of resultant sizes and reduces run of mine coal in one operation.

All Bonded crushers have heavy coil springs that act as an adjusting mechanism as well as a safety device and they are complete with steel hoppers. Write for Bulletin #119 describing complete line of Bonded Crushers. Priced from \$527.00

#### NEW BONDED® FEEDERS



For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. All models available in abrasion resistant alloy steel plate. Capacities to 250 tons per hour. Write for Bull. #1140 & #182.

Priced from

### NEW BONDED BUCKET ELEVATORS

Open or Enclosed Vertical or Inclined Bucket Elevators with continuous or spaced buckets mounted on chain or belting. Recommended for small to medium size lumps of coal, fine abrasive material such as dry sand, coke breeze, wet slag and many other bulk materials. Because of the wide variety of sizes and types, prices will be quoted on request. Write for Bulletin #1047.

#### BONDED SCALE AND MACHINE COMPANY

PHONE Evenings: AX. 1-2213, HU 6-3156 Crushers and Feeders COLUMBUS 7, OHIO -2186 WRITE FOR FREE CATALOG AND PRICES
Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, PHONE Days: Hickory 4-2186 2190 5. 3rd Street

#### HURRY - - -HURRY HURRY

### NOW DISMANTLING

BLUE BIRD COAL COMPANY MINE NO. 8 Harrisburg, Illinois

Latest type equipment, all trackless. Coal conveyed by belt.

- 2—Juy 3.22.1. Serving Diseases.

  storing, Elevating Diseases.

  Matses.

  —Rubber-Tired Hydrau le Drill.

  3—Rubber Tired Pin-Up Machines.

  All the abers 230 wit DC.

  2—Juy F. Gut Trucks. 220 wit AC.

  3—Joy B. BU Leading Machines. 220 wit AC.

  3—Goodman 312 Cutting Machines. 220 wit AC.

  3—Goodman 512 Cutting Machines. 220 wit AC.

  3—Rubber-Tired Battery Supply Trastors.

  20—Rubber-Tired Supply Cars.

  Supply Cars.

  Supply Cars.

- -loy 118U Cutting Machine with bugdusters and SWAI Lires. 120—Jairrey 32—B tandem drive 36" Belt Conveyors. 300" to 2000" long. 1907 long. 1907
  - i-300KW Westingnose perfect |
    -300KW General Electric Motor Generator Setno six roboiit.
    |--180KW Westinghouse Motor Generator Set-
  - excellent.
    4.000° of 1,000,600 CM Cable. Other sizes also.
    Complete 5 track tipple with Jeffrey Jig 2 compartment washer, Vibertours, Leading Booms, Conwaysw, Car Spotters, etc.
    Large steck of mine complete for all the above.

Buy direct from the mine and take advantage of the huge savings! Immediate delivery can be arranged to any point in America.

WRITE

A. B. BIAS, SALES ENGINEER

PHONE

### MACHINERY EXCHANGE COMPANY

Logan, W. Va. Box 1386 Phone 2533

Phene 40-F-3, Harrisburg, Illinois or if more convenient

Ashland, Kentucky, Bex 386 Phone East 4-2101

COAL CRUSHERS

1-24" x 24" Jeffrey Single Roll
1-19" x 18" Jeffrey Single Roll

#### COAL CUTTERS

- Goodman type 112 shortwell, A.C.
  Sullivan type 78 super-shortwall, A.C.
  Sullivan type 78 super-s.ortwall, D.C.
  Sullivan type 62-7. A.C.

  —jeffrey type 28-A, A.C.
- SHAKER CONVEYORS
- 7-Goodman type G-20 6-Goodman type G-15 1-Jey type UN-17 4-Vulcan type 25/30
- CHAIN CONVEYORS

  1.—Jeffrey 61-116 face conveyor

  1.—Jeffrey 61-EW elevating conveyor

- PICKING TABLES
  1-50"x41'6" Card pan conveyor loading boom. two sections
  -48" x 51" Card pan conveyor leading boom,
  two sections

- BATTERY LOCOMOTIVES
  3-3/g-4 ton Mancha, 24" gs.
  1-4 ton Westinghouse, 24" gs.
  1-4 ton Irrarian 36" gs.
  2-6 ton 'onoral Electric 36" gs.
  2-7 ton General Electric, 36" gs.
  1-7 ton Allas-36" gs.
  3-8 ton Irrolion, 36" gs.
  2-8 ton General Electric, 36" gs.
  2-8 ton General Electric, 36" gs.
  4-10 ton Atlas, 36" gs.
- TROLLEY LOCOMOTIVES
  2—10 T. Jeffrey. 42" ga.
  1—13 T. Goedman. 42" ga.
  1—13 Jeffrey. 42" ga.
  1—15 T. Jeffrey. 42" ga.

### SHUTTLE CARS

1—Joy model 600 1P, battery operated 7—Joy model 6001, bottery operated

- MINE FANS
  1—120" Joy La-Del axial flow fan, model L-14
  1—7" Jeffrey aerodyne 2 s'age fan
  - SINCE 1898 DEALERS IN DEPENDABLE RECONDITIONED MINING MACHINERY

### OF ALL TYPES

### MORSE BROS. MACHINERY COMPANY

2900 Brighton Blvd., Denver, Colorado

20# - 30# - 40#

### NEW RAIL IN STOCK

LEFTON INDUSTRIAL CORP. Genl. Office: 212 Victor St.

St. Louis 4, Mo.

### SAVE MONEY! UNUSED **6X6 ARMY TRUCKS**



- · From Government Storage!
- · Unused and Guaranteed!
- · Factory New Condition!
- Reconditioned Trucks also Available!

Save up to \$3,000 on one of our unused Army trucks. See for yourself how TWO of our trucks cost you even LESS than one new truck.

Compare our Tandem Axle Trucks with front wheel drive, 10 forward speeds, overdrive and new mud and snow tires with similar equipment elsewhere.

Investigate now! . . . There's no obligation . . . and we deliver on approval!

For Specifications, Prices, Delivery Write, Wire or Phone Collect—Jackson 5-7841 MILTON Y. TOOMBS, JR. Sales Manager

MEMPHIS EQUIPMENT)

CONSTRUCTION AND AUTONOTIVE COMPANY.
EQUIPMENT AND PARTE
766 SO. THIRD ST. MEMPHIS, TENNESSEE

### FOR SALE STRIP EQUIPMENT

- 1-Marion 40A Dragline, #8513, 80' Boom 3 yd bucket P6H 955 Dragline, #7941, 80' Boom 3 yd
- Bucker 1—75H 855B Shovel, #11576, 1½ yd bucker 1—0-8 Angle Dozer 1—0-7 Dozer Spare parts for above at reduced prices

Write or call Greensburg-Connellsville Coal & Coke Co.

1100 Union Trust Building Pittsburgh 19, Penne. ATN: Mr. G. R. Ondroke Telephone—Atlantic 1-1576 or urgettstown, Pa.—Whitney 7-9527

Save on Your INDUSTRIAL TRACK FULLY FOSTER GUARANTEED QUALITY RELAYING RAILS Handle more cars better-cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch

Material and Track Accessories. SEND FOR CATALOGS RAILS - TRACK EQUIPMENT - PIPE - PILING

ILB HOSTER co.

### LOCOMOTIVES

THE IRONTON ENGINE COMPANY FARMINGDALE, NEW JERSEY (Formerly Irentes, Ohio, 1902-1956)



Your inquiry

will have

Special Value . . .

If you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but, more important it will identify you as one of the men the advertiser wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

### SHOVELS - DRAGLINES DRILLS CRANES — EUCLIDS

7400 Marion Dragline, 160', 13 yard 625 Page Diesel Drag, 150', 10 yard 4500 Manitowoc Drag, 120', 5 yard 621-S Page Diesol, 135', 6 yard 7-W Monighan Elec. Drag, 120', 7 yd. 7-W Monighan Elec. Drag, 120', 7 yd. 618 Page Diesel Drag, 120', 5 yd. 5-W Bucyrus Monighan Drag, 120', 5 yd. 2400 Lima Dragline, 130', 5 yd. 111-M Marion Diesel Drag, 100', 4 yd. 1055 P&H Dragline, 80', 3½ yd. 1201 Lima Dragline, 85', 3 yd. 1201 Lima Comb. Shovel & Crano 955 P&H Dragline, 90°, 2½ yd. 54-B Bucyrus Erie Drag, 85°, 2½ yd. 3500 Manifowoc Drag, 85°, 2½ yd. 40-A Marien Drag, 90°, 2½ yd. 2000-B Manifowoc Cranes 604 & 802 Lima Cranes 151-M Marion Elec. 5 yd. Shovel 4500 Manifewec 5 yd. H.L. Shovel 1601 Lima 4 yd. Standard Shovel 120-B Bucyrus Erie 4 yd. Electric Shovel 1201 Lima Standard 3½ yd. Shovel 1055 P&H 3½ yd. Standard Shovel 1201 Lima 2½ yd. H. L. Shovel 955 P&H 2½ yd. Standard Shovel 802 Lima Comb. H. L. Shovel & Drag 54-B Bucyrus Erie 21/2 yard H. L. Shovel 51-B Bucyrus Erie 2 yd. Shovel Unit 1020 3/4 yard Shovel P&H, Lorain, Bucyrus Erie Truck Cranes 600 Reich Heavy Truck Mounted Rotary Air Drills 58-BH Joy Champion Rotary Air Drills McCarthy Coal Auger Drill Compton Coal Auger Drill

Mayhew Retary Truck Mounted Air Drills Portadrill Truck Mounted Air Drill Euclid Trucks-Bottom & Rear Dumps Caterpillar, International & Allis-Chalmers Bulldozers

42-T, 29-T & 27-T Well Drills

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton Nat'l. Bank Bldg. axleton, Pa. GLadstone 5-3638 Hazleton, Pa.

### TRUSTEE IN BANKRUPTCY SALE

### PUBLIC AUCTION **September 30, 1957**

Chilton-Hernshaw Coal Company

At mine site at Lake. Logan County, W. Va.

Logun County, W. Va.

1 sleel, end dump, 44" gauge mine cars
2 Jaffrey 88 mine lecomotives
1 Goodman 12AA short-wall cutting machine
1 Goodman 824 cutting machine
1 Whaley leading machine and a large quantity of 20#, 30#, and 40# steel and trolley wire.

Equipment may be inspected upon application to John R. Glenn, Trustee, at Logan, West Virginia, Telephone No. "Logan 2119".

#### CHICKEN THE OR THE EGG?

Like the old gag about "which came first, the chicken or the agg" is the questi-whether J. T. FISH is the best and biggest outfit in mining machinery and equip because they give the most for the least or whether they give the most for the because they are the biggest and the best. What difference does it make—you either way! Call on us for your requirements—everything and anything for the efficient mining of

everything and anything for the officient mining of coal. WE OWN WHAT WE ADVERTISE

THE AMPLENTIDE

--Goodman 12AA's and 112AA's.
2--Goodman 12A Stabbers.
2--Goodman 12A Stabbers.
13--Joffrey SbL's, an its well trucks.
13--Joffrey SbL's, an its well trucks.
13--Joffrey 35B's and 35BB's.
1--Joffrey 25B's on track.
1--Joffrey 2BL on track, serfect.
1--Builtran CR-10's. 13' high.
12--Builtran CR-10's. 13' high.
17--Joy Loaders. all types.

20-Bullivan CR-10'e, 13" high.

LOADING MACHINES

17—Joy Loadern, all types,
21-leftray BCLR's on rubber, 20",
31-leftray L-500 Londern,
21-leftray L-500 Londern,
22-leftray Malay Ms. Automat Londers,
23-leftray S2-B, 30" Belt Conveyors, 1500' each,
23-leftray S2-B, 30" Belt Conveyors, 500' to
2300' catch, cascilent.
43-loy 30" Underground Beit Conveyors, 500' to
2300' catch, cascilent.
43-loy 30" Grown 30" Belt Conveyor, 1000' ex10-Barbor Grown 30" Belt Conveyor, 1000' ex24-leff M 13" Rhoom Conveyors, 300 ft.
4-loy Lafel Un-17 Shakers,
24-leff M 13" Rhoom Conveyors, 300 ft.
4-loy Lafel Un-17 Shakers,
35-Gandel Un-17 Shakers,
36-Gandel Un-18 Shakers,
36-Gande

Motors—new.
CONVERTERS AND DIESEL PLANTS
-50KW, 6. E. TG-6, 275 volt Rotary Converter.
-100KW, 8. E. TGC-6's, 275 volt Botary Converter.
verters.

3---109KW, G. E. TOC-6's, 275 walt Butary Converters.

1--159KW, G. E. HOC-6 275 welt Retary Converter.

1--159KW, S. phase, Allis Chalmers Helary Gonverter, 275 welt DC, perfect.

1--20KW, S. E. HOC-6 Retary Converters, 275 welt.

1--20KW, wasting-house Retary Converter, 275 welt.

1--20KW, wasting-house Retary Converter, 275 DC, 1-20KW, wasting-house Retary Converter, 275 DC, 1-20KW, Allis Chalmers Ratary Converters, 275 DC, 1-20KW, allis Chalmers, 275 DC, 1-20KW, allis Chalmers

hears.

NG Set, Westinghouse, rebuilt.

1050kW, Afile Chaimers MG Set, 285 DD volt.

1050kW Matinchause, 500 volt. MG Set, rebuilt.

1050kW Westinghouse, 275 volt MG Set, rebuilt.

i—Cummins 125KW Diesel with 220 vort DC Gen-walns.

1—700 H. P. Shaft Heist, complete,

Complete steam plan, will sell all or any part.

Bollers, like new. 100 H. P. and 300 H. P. Alse transformars, turbines, etc.

3—Complete Tippics with Oleaning Plants, "2 all steel".

MISCELLANEOUS

Steel ... MISCELLAHEOUS
Battery Suspity Tractors, rebber tired.

10—Air Compressors i H. P. to 46 H. P.

40 Mine Pumps, all types.

2—Barber Groons off propelled busket olevators,
Plos. plastic, steel, transit, all sizes i 2 o 6".

43 Mine Cars, deel, bettom, 42" Ga.

50 Mine Cars, 48" Ga. dree bottom, 20" above rail.

100 Mine Cars, 18" high, and dump, 44" Ga.

50 Mine Cars, 18" high, and dump, 44" Ga.

50 Mine Cars, 18" high, and dump, 44" Ga.

50 Hone Fayre HKL and HG Car Spotters,
CHL Sullivan Car Spotters

CHL Sullivan Car Spotters

HG Room Heists

1—12 ten Differential Slate Larry

Inoline Heists, 25 to 50 H. P.

1—Jeffery 6 ft. Aerodyne Fan

1—Sterage Tank, 4,000 Gallon,
Fine Sterage Tank, 4,000 Gallon,
Fine S

WE OWN WHA

JOY EQUIPMENT—REBUILT

I—sey BAE Super 148U Leader.

—sey 148U Leaders, low pedestal, 7AE,

—sey 128U Leaders, 2SE, latest type.

—sey 128U Sey 128U Leaders, 2SE, latest type.

—sey 128U Sey 128U Leaders, 2SE, latest type.

—sey 128U Sey 128U Care, rebuilt.

—sey 2SE is Shuttle Cars, rebuilt.

—sey 2SE is Shuttle Cars.

—sey 2SE is Shuttle Cars.

Geodman 512 Cutting Machine, perfect, Geodman 512 Cutting Machines, 728 volt AC, -Jeffrey 2014 Cutting Machines, Universal head, outs anywhere in seam, 58" hi, on rubber tires, perfect, —Lee Norse law vein Machine Carrier,

LOCOMOTIVES Jeffroy MH-2154's, 15 tens, perfect, 42" Ga. Jeffroy, 13 ten, type MH-110, 38", 42" and 44"

-Jeffrey, 13 ton, type MH-110, 38", 42" and 44" Ga.

-Jeffrey, 10 hos, type MH-18, 49" and 48" Ga.

-Jeffrey, 20 hos, type MH-78, 42" and 48" Ga.

-Jeffrey, 8 hos, type MH-78, 42" and 48" Ga.

-Jeffrey, MH-78, Leconctive Units—chean.

-Jeffrey, 8 ton, type MH-100, error size frame
-Jeffrey, 8 ton type MH-100, error size frame
-Jeffrey, 8 ton, type MH-100, error size frame
-Jeffrey, 8 ton, type 188, 29" above rail, serfey,

-Jeffrey, 4 ton, type MH-96, 42" above rail, serfey,

-MH-96, 4 ton, type 325 Loosedive, 22" high.

-M. E. 5 ton, type 325 Loosedive, 42",

-44" and 48" Ga.

-G. E. 5 ton, type 320 Loconctive, 44" april

-G. E. 6 ton, type 320 Loconctive, 42", 44" april

-Goodman, 4 ton, 5-30 Loconctive, 22" above rail,

-Goodman, 4 ton, 5-30 Loconctive, 22" above rail.

Tipple EQUIPMENT

I—Cedar Ranids nortable arman Recoming Plant.

Affile-Chairmon S' x 14' Risaffe Vibrator.

- X 10' Robbins Gyrex Vibrator.

- K x 10' Robbins Gyrex Vibrator.

- Rebairmon S' x 10' Robbins Gyrex Vibrator.

- McMaily Robbins Gyrex Wibrator.

- Loffrey Robbins Gyrex Washer.

- Loffrey Robbins Gyrex Washer.

- Loffrey Robbins Gyrex Washer.

- Loffrey Robbins State Comparison of Comparison State Comparison St

CUTTING MALETING.

-isfrey 2018 Universal on rubber,
-iser vubber tired 118U Cutters with bug-dusters.
-Goodman on eats, 31" overall height,
-Mahy Goodman 212, rebuilt, 230 voit DC,
-Baby Goodman 212, rebuilt, 230 voit 00,
-Goodman 312"s, (3" high,
-Goodman 312"s, (3" high,
-Goodman 312"s, with Bug-dusters, like new,
-Goodman 312"s, rebuilt, or a removed from cerv-

les.

1-Jay 5B1 Baby Manhinos. 239 volt DC.

296 volt AC.

406 Electris Moters. 3 to 250 H. P.

407 Hugo stock of Mine Supplies.

Send us your Inquiries WE BUY—SELL—TRADE Thousands of other Items

FROM ONE ITEM TO A TRAINLOAD

Phone 2825

J. T. FISH

Logan, W. Va.

### **BOUGHT AND SOLD**

We carry a large stock of rebuilt and quaranteed transformers, and invite your

Custom-built transformers and coils manufactured to your specifications.

Expert Repair Service—all makes and sizes of transformers rewound, repaired and redesigned. Ask for our price schedule and stock list Bulletin 101.

### THE ELECTRIC SERVICE CO., INC.

5322 Hetzel St.

45 Years' Dependable Service

Cincinnati 27, Ohio

### -ADVERTISERS IN THIS ISSUE-

\*Indicates more product information may be found in company advertising appearing in COAL AGE 1957 Mid-July Mining Guidebook and Buying Directory Issue, Check your Guidebook index.

Acme Machinery Co 101	General Tire & Rubber Co
Alemite div. Stewart Warner Corp 119	Goodman Manufacturing Co 29
*Allegheny Ludlum Steel Corp	Goodrich Chemical Co
*Allis-Chalmers General Products Div107, 147	Goodrick Industrial Products Co., II. F 1
Allin-Chalmers Construction Machinery Div	Goodrich Tire Co. div. B. F. Goodrich Co 103
*ACF Industries Inc. American Car & Foundry Co	Gulf Oll Co
American Cable Div. American Chain & Cable Co	*H & L Tooth Co
*American Mine Door	*Hendrick Manufacturing Co 166
American Oil Co	*Hewitt-Robins, Inc
*American Pulveriser Co	Halburt Oil & Grease Co 2-3
*American Steel & Wire div. United States Steel Corp30-31, \$2-\$3, 121	International Harvester Co. (Trucks)16-17
*Anaconda Wire & Cable Co	International Salt Co
Armstrong-Bray & Co	Jeffrey Manufacturing Co
Ashland Oil Co	*Jones & Laughlin Steel Corp
Austin Powder Co 108	*Joy Manufacturing Co34-35, 160
Barber-Greene Co	Kaiser Aluminum & Chemical Corp144-145
Bethlehem Steel Co	*Kennametal, Inc
Bird Machine Co 4	Kensington Steel Co
Boston Woven Hose & Rubber Co	Koehring Co22-23
*Bowdil Co 64	Laboratory Equipment Corp
Bucyrus-Erie Co	Les-Norse Co
*Cardox Corp. 62	*Leman Machine Co
Caterpillar Tractor Co	*LeRoi div. Westinghouse Air Brake Co 141
*Centrifugal & Mechanical Industries, Inc 37	LeTourneau-Westinghouse Co
*Chicago Pneumatic Tool Co. 103	*Linatex Corp. of America
Cities Service Oil Co	*Link-Belt Co Fourth Cover
Clark Equipment Co	*Long Co
Coal Age 171	Lubriplate div. Fiske Bros. Refining Co 136
Colorado Iron Works Co	*Ludlow-Saylor Wire Cloth Co 116
No. 11.	Lukene Steel Co
Differential Steel Car Co	*Mack Trucks Insert between pp. 36-37
Dorr-Oliver, Inc	Manhattan Rubber Div
Dow Chemical Co	Manning Co., Chas. E
duPont de Nemoure & Co., E. I.	*McNally Pittsburg Manufacturing Co.
(Ekartomers Div.)	Insert between pp. 20-21, 124
Direction, Inc.	Metal Carbides Corp
Ensign Bickford Co	*Mine Safety Appliances Co Second Cover
Ensign Electric Co	Morton Salt Co 49
*Exide Industrial Div. Electric Storage Battery Co	National Mine Service Co 123
	*National Maileable & Steel Castings Co 128
Fairbanks, Morse & Co	*Nolan Co 118
Fairmont Machinery Co 40	Ohio Brass Co Insert between np. 100-101
*Falk Corp	Okonite Co
Fernos, Inc	
Firth Sterling, Inc	Paris Manufacturing Co 160
Fletcher & Co., J. H	Parker Appliance Co
Flexible Steel Lacing Co	Pattin Manufacturing Co
Fuller Manufacturing Co	Penn Machine Co
	Porter Co., Inc., H. K. Quaker Rubber Div
Gates Rubber Co	West Virginia Wks. Connors Steel Div 142
General Electric Co58-50	Post-Glover Electric Co

Reynolds Metals Co
Roebling Sons Corp., John A
*Rome Cable Corp
Ryerson & Son, Inc., Joseph T 6
Ryerson & Son, Inc., Joseph L.,
Schroeder Bros
Searchlight Section
Simplex Wire & Cable Co
Sinclair Refining Co
*Stamler Corp., W. R 152
Standard Oil Co. of Indiana 42
Sun Oil Co Insert between pp. 116-117
*Texas Co 8-9
Thurman Machine Co
Timken Roller Bearing Co 54
Union Wire Rope Co
United States Rubber Co.
(Mechanical Goods Div.)
United States Steel Corp48, 93
Victaulic Co. of America
Wedge-Wire Corp
Western Insulated Wire Co 166
White Diesel Engine Div. White Motor Co
Wickerley Conney Steel Div
Colorado Fuel & Iron Corp 10
Wilmot Engineering Co
Wilson Marine Transit Co
Winslow Government Standard Scale Works, Inc
and the state of t
PROPESSIONAL SERVICES 172
PROFESSIONAL SERVICES 172
CLASSIFIED ADVERTISING F. J. Eberle, Business Mgr.
MPLOYMENT OPPORTUNITIES 173
PECIAL SERVICE 173
QUIPMENT (Used or Surplus New)
For Sale
POE SARE

### ADVENTISING SALES STAFF

WANTED

Atlanta 3......M. H. Miller, 1301 Rhodes-Haverly Bldg., Jacksen 8-6951 naversy Bong., Jackson 2-9951
Chicago 11...O. A. Mark, F. W. Roets, 520
N. Michigan Ave., Mohawk 4-5800
Cieveland 18....J. E. Lange, 1510 Hanna
Bidg., Superior 1-7000 6-3478
8t. Louis S......P. W. Basts, Continental
Bidg., 2615 Olive St., Jefferson 5-1867
Ben Francisca 4....J. W. Ottaron, 68 Post
St., Douglas 2-4690
London EO 4, England...H. Lagler, McGrawHill Ca., Ltd., 98 Parringdom St.

### FULLER ROADRANGER® Transmission standard in new LeT-WesCo truck

Fuller's 9-speed R-1150 ROAD-RANGER Transmission was selected for the revolutionary new 30-ton LeTourneau-Westinghouse off-road hauler "... because of the wide range of gear selection and speeds, plus the fact that it shifts easily and quickly."

Merle R. Yontz, President, says: "We wanted a tough, fast, high-production hauler which would be cheaper to run, simpler to maintain, and easier to operate—one that would make more money per trip for its owners."

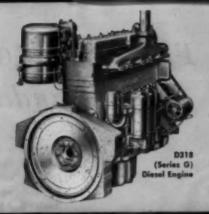
So, the LW-30 features the new

- No gear splitting-9 selective gear ratios are evenly and progressively
- Pre-selective countershaft brake for easier, quicker shifts
- Average 38% between ratios
- One shift lever controls all 9 forward and 2 reverse speeds
- Engines operate in peak hp range with greater fuel economy
- Less driver fatigue-1/3 less shifting than with comparable multispeed transmissions
- Range shifts pre-selected-automatic and synchronized



rge Division, Milwaudes 1, Wiscomin \* Sholer Axle Company, Laulville, Kantucky (Subsidiary) \* les & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 2. Oklahoma

# A CAT\* DIESEL ENGINE IS PAYING ITS WAY ON THIS TOUGH JOB





Paul Percival and his son John are strip mining bituminous coal on Barclay Mountain in eastern Pennsylvania. They use a Bucyrus-Erie 22-B shovel powered by a Caterpillar D318 (Series G) Diesel Engine to pull up and load the soft coal; a Cat D8 Tractor to push away the overburden.

"In mining on a royalty basis," Mr. Percival says, "equipment must pay its way. Ours does. We started this job with Cat power and that's what we'll always use. We have a tough job here, and Cat equipment can take it in stride. It hasn't let us down for a minute."

The D318, one of the smaller engines (approx.: 76x31x53", 2,935 lb.) in the Caterpillar line, is rated at 137 HP (maximum output capacity). It is a compact, six-cylinder, four-cycle, heavy-duty unit. Little maintenance is required. There are no cylinder ports to clean; the fuel system requires no adjusting. Like all Caterpillar Diesels, the D318 is economical to operate, burning low-cost fuel without fouling for three-way savings: cheaper fuel, less fuel, less attention.

The new D318 (Series G) Turbocharged Engine delivers more horsepower (175 maximum output ca-

pacity) in a smaller space (approx.: 60x36x51", 2,450 lb.). Both engines are versatile, and answer a number of power problems.

In a Caterpillar Engine, the horsepower promised is the horsepower delivered. This is backed by a certificate signed by Caterpillar and notarized. This is one big reason why you should specify Caterpillar Engines in buying optional power equipment.

Your Caterpillar Dealer is a power expert. He offers round-the-clock availability of service, and parts you can trust. Take your power problems to him. Let him show you the *certified* power plant that will do the most efficient job for you.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

### CATERPILLAR'





### HOW LARGE A MINE CAR WILL YOU REQUIRE IN 1965?

The trend is *up*-mine car size projections indicate that by 1965 much larger equipment will be required to meet increased production demands.

When you are planning purchases of new cars, it pays to go to a manufacturer who has the experience and facilities necessary to build the *full range* of types and sizes. **QCf** has been building mine cars for many years, in sizes from 2½ tons to a walloping 30 tons!

Whether your mining operations call for drop-bottom, end dump, or rotary dump type cars you can depend on  $\mathbf{Q} \subset \mathbf{f}$ . All offer modern features, such as anti-friction bearings for safe, high-speed operation, all-welded construction, automatic couplers for speed and safety in handling.

Get full information about the complete line of  $\mathbf{Q} \mathbf{C} \mathbf{f}$  Constant Haulage Mine Cars in the sizes and types to meet your expanding needs. Why not contact the nearest  $\mathbf{Q} \mathbf{C} \mathbf{f}$  office.

QCf MINE CARS

AMEDIAN CAR AND FOUNDRY

Oly C Industries, incorporated

FOR CONSTANT HAULAGE

'ork · Chicago · St. Louis · Cleveland · Washington, D. C. · Philadelphia · San Francisco. Plants: Berwick, Pa., Huntington, W. Va., St. Louis, Mo.



View of large metallurgical coal cleaning plant shows two of three Link-Belt Multi-Louvre Dryers which provide low-cost moisture reduction,

How LINK-BELT Multi-Louvre dries coal uniformly, gently with

## LOWER TEMPERATURE AND LESS HORSEPOWER

TODAY, more and more coal operators are switching to the Link-Belt Multi-Louvre dryer. The reason: they get a more marketable coal at lower cost per ton. Here's why:

### LESS DUST AND DEGRADATION

Gentle action, plus accurate, automatic control, maintains size of your product whether it's 1½ inch or minus 28-mesh.

### LOWER POWER REQUIREMENTS

Thanks to the reduced resistance to incoming air because of the coal's cascading action over the louvres, smaller exhaust fans can be used.

### NO OXIDATION

Product temperatures of 100° to 120°F prevent oxidation of coal. This is particularly important when drying metallurgical coal.

### GREATER SAFETY

Explosion hazards are minimized. Multi-Louvre's low air velocities reduce dust in the air stream. For other reasons why Multi-Louvre Dryers are first choice among experienced operators, see the coal preparation specialist in the Link-Belt office in your field. Or write for a copy of Book 2609.





MULTI-LOUVRE DRYERS

LINK-BELT COMPANY: Chicago 9, Birmingham 3, Cleveland 15, Denver 2, Detroit 4, Huntington 9, W. Va., Indianapolis 6, Kansas City Mo., Louisville 2, Pittsburgh 13, Seattle 4, St. Louis 1, Scarboro (Toronto 13), Springs (South Africa).